SKSSWEDEN

# LINEAR ACTUATORS
# ELECTRONIC DRIVERS

## TECHNICAL CATALOGUE

ATEX CE IP65

MecVel®

# DNV BUSINESS ASSURANCE

# MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. CERT-02894-98-AQ-BOL-SINCERT

Si attesta che / This is to certify that

## MecVel S.r.l.

Via Due Portoni, 23 - 40132 Bologna (BO) - Italy

è conforme ai requisiti della norma per i sistemi di gestione:
has been found to conform to the management system standard:

UNI EN ISO 9001:2008 (ISO 9001:2008)

Questa Certificazione è valida per il seguente campo applicativo:
This Certificate is valid for the following productor service ranges:

Progettazione, produzione, vendita e assistenza
di attuatori lineari elettromeccanici e martinetti
(Settore EA : 18)

Design, manufacture, sale and servicing
of checks mechanical linear actuators and screw jacks
(Sector EA : 18)

Data Prima Emissione/Initial Certification Date:
**1998-04-23**

Il Certificato è valido fino al:
This Certificate is valid until:
**2018-05-21**

L'audit è stato eseguito sotto la supervisione di/
The audit has been performed under the supervision of

**Costantina De Paola**
Lead Auditor

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

SGQ N°003 A PRD N°003 B
SGA N°003 D SSI N°002 G
SCR N°004 F FSM N°001 I

Membro di MLA EA per gli schemi di accreditamento SGQ, SGA, PRD, PRS, ISP e LAB,di MLA IAF per gli schemi di accreditamento SGQ, SGA, SSI, FSM e PRD e di MRA ILAC per gli schemi di accreditamento LAB

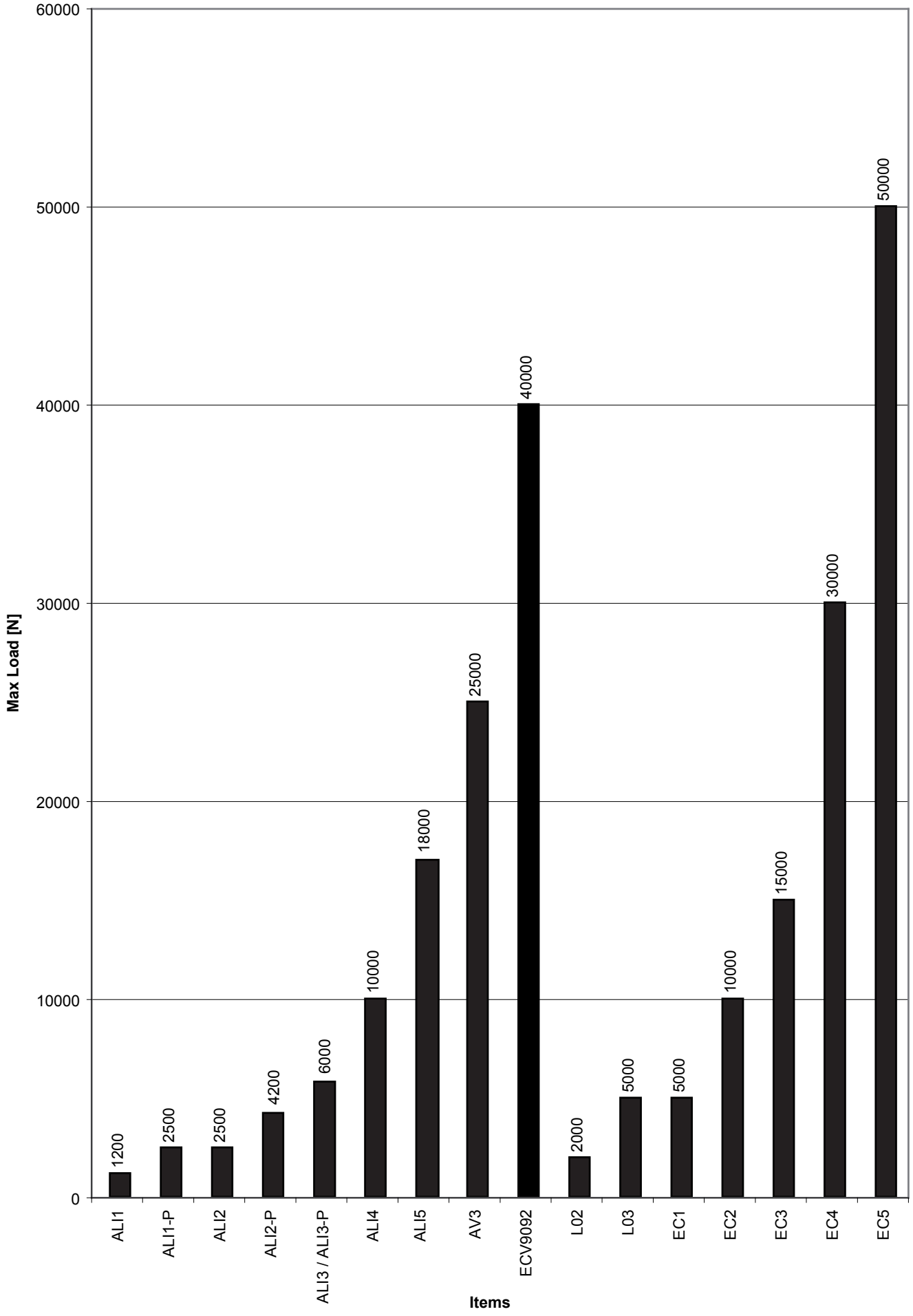
Luogo e Data/Place and Date:
**Vimercate (MB), 2015-03-19**

Per l'Organismo di Certificazione:
For the Certification Body:

**Zeno Beltrami**
Management Representative

La validità del presente Certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione.
Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

DNV GL BUSINESS ASSURANCE ITALIA S.R.L. - VIA ENERGY PARK, 14 - 20871 VIMERCATE (MB) - ITALY – TEL. 039.68 99 905 – WWW.DNVGL.COM/IT

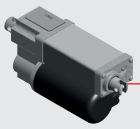

60000
50000
40000
30000
20000
10000
0
Max Load [N]
1200
2500
2500
4200
6000
10000
18000
25000
40000
2000
5000
5000
10000
15000
30000
50000
ALI1
ALI1-P
ALI2
ALI2-P
ALI3 / ALI3-P
ALI4
ALI5
AV3
ECV9092
L02
L03
EC1
EC2
EC3
EC4
EC5
Items

# INDEX

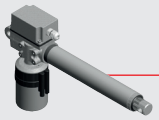
## LINEAR ACTUATORS
## ELECTRONIC DRIVERS

Linear actuators
and gear boxes selection criteria 4

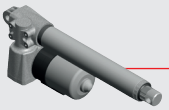
ALI 1 13
*Max force: 1.200 N*
*Max speed: 90 mm/s*
*DC*



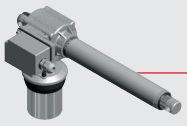
ALI 1-P 17
*Max force: 2.500 N*
*Max speed: 16,5 mm/s*
*DC*



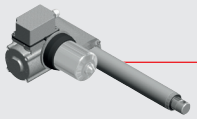
ALI 2 21
*Max force: 2.500 N*
*Max speed: 110 mm/s*
*AC/DC*



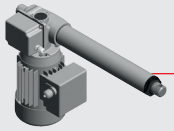
ALI 2-P 25
*Max force: 4.200 N*
*Max speed: 30 mm/s*
*DC*



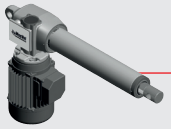
ALI 3 29
*Max force: 6.000 N*
*Max speed: 35 mm/s*
*AC/DC*



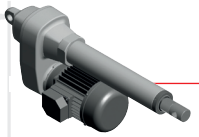
ALI 3-P 33
*Max force: 6.000 N*
*Max speed: 35 mm/s*
*DC*



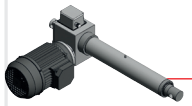
ALI 4 37
*Max force: 10.000 N*
*Max speed: 100 mm/s*
*AC/DC*



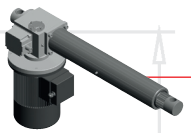
ALI 5 41
*Max force: 18.000 N*
*Max speed: 93 mm/s*
*AC*



ALI 5-P / ALI 5-PB 45
*Max force: 15.000 N*
*Max speed: 220 mm/s*
*AC*

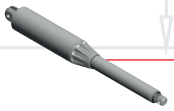


AV 3 49
*Max force: 25.000 N*
*Max speed: 55 mm/s*
*AC*

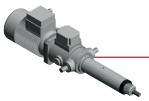


ECV 9092 53
*Max force: 40.000 N*
*Max speed: 45 mm/s*
*AC*

L0 2 57
*Max force: 2.000 N*
*Max speed: 100 mm/s*
*DC*



L0 3 61
*Max force: 5.000 N*
*Max speed: 30 mm/s*
*DC*



EC 65
*Max force: 5.000 N - ... - 50.000 N*
*Max speed: 230 mm/s - ... - 15 mm/s*
*AC*

Accessories and options 71

Sales conditions 100

## LINEAR ACTUATORS AND GEAR BOXES SELECTION CRITERIA

### GENERAL WARNING

Actuators and gear boxes are devices meant to be installed into larger machines therefore **they cannot be considered as safety devices** (see EC law CE 89/392 and further CE 91-368,93/44,93/68). They are not elements that shall discriminate, with their use or with their fault, safeguard of people's safety and health. Thus it is not allowed to use MecVel products as safety devices.

### INSTALLATION, USE, MAINTENANCE AND WASTE GUIDELINES

MecVel recommendations:

- Actuators and gear boxes being installed by qualified and authorised technicians
- Electrical connections done by qualified personnel; during installation main electric power supply shall be turned off so to run safely all these operations (wearing also protection suits, gloves and glasses)
- Actuators and gear boxes need very few maintenance operations: cleaning and eventually greasing (according to instruction manuals)
- Scheduled inspections to working actuator or gear box in order to detect in time possible problems: in case of doubts contact MecVel
- Ilf something wrong is detected do not try to fix it without MecVel's technical advise: its after-sales dept. will be at your complete disposal to solve it out

All products are delivered with proper packing, according to customer needs and goods dimensions / weight. We recommend a safe product handling, using for example forklifts, safety belts….
Package, as well as the actuators themselves, shall be disposed / wasted according to laws in force in the user's Country.

### INTRODUCTION

Linear actuators are independent systems used to obtain linear movements: basically, they are made up by an electric motor, rotating a lead screw directly or by means of a gearbox.
A nut is then allowed to move along the lead screw carrying in and out a push rod connected to the nut itself.
Load shall be axial only, but it can be tensile or pushing, no matter what push rod direction is. Actuators can work both with or without load. Self-locking or not self-locking behaviour depend on the gearing ratio and load value. In any case, self-locking is always possible with additional components.
According to type of actuator and driving / control system used with it, we can have a simple ON / OFF device (pushing and/or pulling) or a servo-mechanism.
Electric actuators main advantages towards pneumatic and hydraulic ones are basically following:
they can easily stop in intermediate positions all along their stroke,
the power consumption happens only while the actuator is working (not necessary to keep it in position for example), the power supply is clean and easy to find, with no need of tubes.
Thus, wirings on applications frameworks will be easier to build and no fluids (i.e. oil) can accidentally be spared. This last feature is necessary in food and textile environments.

### ACTUATOR MAIN COMPONENTS

Linear actuators consist in an electric motor directly connected to lead-screw/nut or by means of a worm gearbox, a belt/pulleys system or planetary gearings (1 or 2 stages).
The system turns out to be a rigid chain.

**Running against mechanical stops causes serious damages to actuator's internal parts!**

**Motors**
Actuators can host different kinds of motors: AC three or single phase, with brake, inverter-friendly, DC, brushless and stepper-motors. Many options are available such as second shafts, manual brake release and so on.
Selection of motor performances (torque, speed, service...) is done according to duty cycle requested to actuators.

### Gear-boxes

Two kinds of gear-boxes are basically used on actuators too:
- Steel worm-screw (1 or 2 stages) and plastic or bronze worm-wheel: wheel's material is chosen according to needed main performances such as low noise, lifetime, reduced backlash
- Planetary gear-box (ALI5-AP, L and EC series): due to its high efficiency this kind is often used when duty cycles are high.

They can have 1 stage with plastic satellites or 2 stages where first one has plastic satellites and second stage has steel ones

### Lead screw

Basically steel made and featuring cold-rolled profile, they are coupled with bronze or plastic polymer in order to grant safety and sturdiness against loads.
In ball-screw versions (VRS), lead screws are cold-rolled and tempered and coupled with hardened-grinded ball-nuts.

### Push rod

Push rods can be aluminium made for actuators whose loads are low, thick chrome-plated steel for those who stand high loads or stainless steel for special applications like in food industries.

## ACTUATOR AND GEAR BOX APPLICATION FIELDS

Actuators and gear boxes can be used in several fields and various machineries. To give an example of how different can be the applications needing actuators we can list a few like: adjusting brushes height in floor-sweeping machines, positioning blades for wood-cutting machines, textile industries, paint and chemical plants, medical equipment (different movements in X-ray machines) equipments for disable / aged people, solar panels, etc..

## PARAMETERS FOR ACTUATOR OR GEAR BOX SELECTION PROCESS

The main features for actuator or gear box selection are:
- load dynamics (load trend along stroke)
- speed (linear speed trend along stroke)
- duty cycle
- environmental conditions
- stroke length
- power supply
- output rpm (gear box)
- output torque (gear box)

The configuration we get will be self-locking or non-self-locking according to its global efficiency.

### Load and linear speed

These two parameters shall be evaluated both separately and together since they may affect each other during actuator working cycle, especially if additional elements like inertial phenomena, vibrations … are involved.
For example, if an heavy load has to be moved with changing speeds involving sharp accelerations and slowdowns, inertial load has to be added to physical load, thus affecting actuator choice.
In these cases please contact our Technical Dept

Temperature working range can also be widened using special materials for some of the actuator components, special lubricants and seals (the same happens for aggressive environments).Of course under-rating of actuator and duty cycle must also be taken under consideration.
In general, ball-screw units are non-self-locking therefore additional devices, such as brakes, can be necessary to lock actuators

### Duty cycle and environmental conditions

These parameters also need to be analyzed as linked together.
Duty cycle is defined as percentage rate between on-time and idle-time, on a timeframe of 5 min.
Environment is mainly related to temperature and occasional aggressive agents affecting materials (humidity, dust, acids…). Standard actuators duty cycle is rated in S3-30%, at 30°C ambient temp.
Working temperature range allowed for standard actuators is -10°C / +60°C.
However duty cycle can be raised building up high-efficiency actuators featuring ball-screws and planetary gearboxes, or over sizing the actuator whose ratings will therefore become higher.
Temperature working range can also be widened using special materials for some of the actuator components, special lubricants and seals (the same happens for aggressive environments).Of course under-rating of actuator and duty cycle must also be taken under consideration.
In general, ball-screw units are non-self-locking therefore additional devices, such as brakes, can be necessary to lock actuators.

**Actuator working stroke**

This feature (standard each 50 mm step) shall be chosen taking under consideration:
- limits tied to high rotation speeds of internal lead screw and to its own weight (in case the actuator is mounted horizontally) (critical Speed diagram is available on any acme screws technical documentation)
- limits linked to lead screw length to avoid buckling problems (see diagram 1 page 10).

Actuator shall than perform its job within its nominal stroke: while designing application / framework, 10mm extra-stroke on both stroke-ends (in and out) shall be included to decrease possibility of going at mechanical stroke.

⚠ **Running against actuator's mechanical stops causes serious damages to its internal components!** In case of strokes 20 times longer than lead screw diameter, 150mm extra stroke shall be included in the design of the actuator so that, when push rod is completely extracted, it has still 150mm more to go: this will give more stiffness to the unit preventing radial backlash.

⚠ Excessive radial backlashes lead to side-forces on actuator's axis, thus unexpected wear and lubricant loss, non regular workouts.

**Power supply**

To choose a suitable actuator it is important to start finding out which kind of electric power supply is available. Not all actuators are prepared for all voltages.

**SELF-LOCKING**

There is not a sharp threshold between self locking and non-self locking conditions, because this feature is affected by gears wear, type of load, presence of vibrations, mounting position etc …When in doubt the only way of being sure of actuator behaviour is testing it on the application.When actuator is not self-locking, its positioning precision and repeatability features are lower: in this case, some additional elements are required, such as brakemotors, control/feedback systems or motor short-circuit to achieve magnetic braking effect (for DC motors without brake only)

**ACTUATOR AND GEAR BOX INSTALLATION**

During machine designing it is extremely important to forsee proper mounting points so that actuator won't have to stand radial forces but axial ones only.
Than, when physically installing actuator into machinery, an accurate alignment of the connecting points is very important to avoid grease losses and nut wear due to radial forces.
Axis of front and back connecting points must always be parallel.
Actuators shall work within their nominal stroke.
When framework is being designed, 10mm extra stroke (in both directions) must be considered to have less possibilities of mechanical end-stops.
Also, when stroke is 20 times longer than lead screw diameter, at least 150mm extra stroke (in extracted position) shall be included in order to prevent the actuator from having radial forces when push rod is completely out.

⚠ **Running against mechanical stop causes serious damages to actuator components!**

⚠ Off-set load lead to side-forces on actuator axis causing unexpected wear, lubricant loss and non-regular operation.

Before starting the actuators or gear box up, following checkings shall be performed:

- If actuator is equipped with limit switches devices, before starting the motor, ensure they are connected and working, in order to avoid any mechanical end-stops.

- Make sure push rod will start travelling in the correct direction and limit switches are correctly adjusted. Start motor "step-by-step" to check all this.

⚠ All wirings of actuator (motor and stroke control devices) must be done with power switched off. If not, both operator and actuator are at risk.

⚠ When actuators are equipped with single-phase motors, capacitors must be discharged before any operation.

⚠ In case limit switches are already adjusted, be careful because manual rotation of push-rod will cause adjustment loss!

**For a correct selection of actuators it is absolutely necessary to refer to above reported instructions and technical advises.**
**MecVel declines any responsibility releted to demanges caused to things and persons due to not proper use of the technical information given on this catalogue or incorrect use of actuators and gear boxes.**
**More information about installation of the actuators are reported in the use and maintenance manual.**

## SERVICE

All actuators with max load lower then ALI5 are long-life lubricated:
no relubrication is needed in case actuators workout is regular.
Other models are equipped with lubricators and schedules for service are advised into user manual for each actuator.

| *Standard lubrificant* | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Brand** | **Products** | **Tmin °C** | **Tmax °C** | **Tdrop °C** | **Base oil** | **Thickener** | **NLGI Class** |
| Vanguard | G.S. Friction 2 | -45 | +150 | +180 | Synthetic | Lithiunm hydroxide | 2 |

| *Alternative lubrificants* | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Brand** | **Products** | **Tmin °C** | **Tmax °C** | **Tdrop °C** | **Base oil** | **Thickener** | **NLGI Class** |
| Klueber | Isoflex LDS 18 Special A | -50 | +120 | 190 | Synthetic | Lithiunm complex | 2 |
| Dow Corning | Molykote BG20 | -45 | +180 | +290 | Synthetic | Lithiunm complex | 2 |

Dedicates lubricants are available for special duties or special environments (e.g. food machinaries); please contact our tech. Department.

**Nut wear check-up**

A scheduled check on nut wear is to be done periodically.
Wire-off motor and put load on push-rod : load value shall be according to model rating (from nominal load till 0,1 times nominal load lowering this coefficient as the actuator size increases).
Apllying both compression and tensile load, check by means of an adial-gauge that axial backlash is lower:

$$Backlash_{(mm)} \leq 0.25 * \frac{screwpitch_{(mm)}}{starts}$$

In case backlash is higher actuator needs to be replaced.
If actuator features ballscrew drive, nut fail first signal is noise higher than usual.
A scheduled manual check as explained above is anyway necessary to monitor regular and linear nut workout.

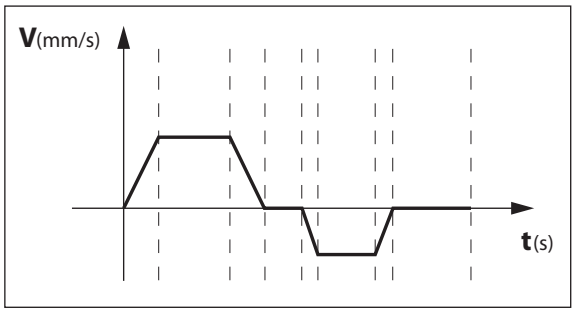
**More information about maintenance of the actuators are reported in the use and maintenance manual.**

## APPLICATION TECHNICAL SPECS FOR A PROPER ACTUATOR CHOICE

| | | | | |
|---|---|---|---|---|
| ***APPLICATION DESCRIPTION:*** | | | | |
| ***POWER SUPPLY*** | ***..... Vac*** | ***..... Hz*** | ☐ ***SINGLE PHASE*** | ☐ ***THREE PHASE*** |
| ***TOTAL LOAD INVOLVED*** | ***..... N*** | ***ACTUATORS FOR EACH SYSTEM: #*** | | ***FOR YEAR: #*** |
| ***DYNAMIC PULLING-HANGING LOAD*** | ***..... N*** | ***DYNAMIC PUSHING LOAD*** | | ***..... N*** |
| ***STATIC PULLING-HANGING LOAD*** | ***..... N*** | ***STATIC PUSHING LOAD*** | | ***..... N*** |

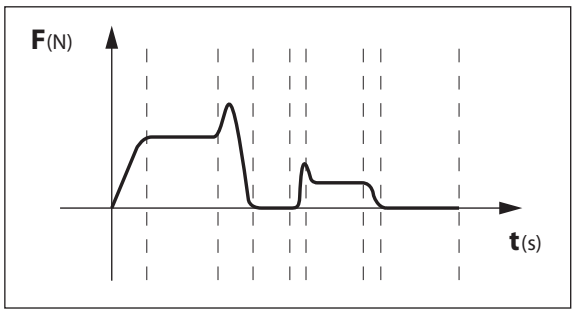
***SPEED TIMING:***


***EXAMPLE:***



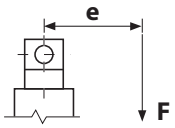

***LOAD TIMING:***


***EXAMPLE:***




(draw an application dimensional outlet)

**Note:** in order to perform a proper actuator selection for to your application technical information available in chapter "Electromechanical Actuators + Jack Choice Guideline" must be carefully considered.




*LOAD SPECS:* *GUIDED* ☐ *VIBRATING* ☐ *OFF-SET* ☐

*WORK STROKE:* ..... *mm* *NOMINAL STROKE:* ..... *mm* *SPEED:* ..... *mm/s*

*ENVIRONMENT: if aggressive, advise*.....
.....
.....

*DUSTY* ☐ *AGGRESSIVE* ☐ *HUMIDITY RATE* ..... *%* *TEMPERATURE GAP:* ..... *%*

*DUTY CYCLE:* ..... *%* *CYCLE HOUR:* *N°* ..... *OPERATING HOURS:* *N°*.....

*REQUIRED PRECISION IN STOPS:* *+/-* ..... *mm*

*STROKE CONTROL:*

*(see more info on catalogue)*

☐ *MECHANICAL LIMIT SWITCHES* *N°*.....
☐ *MAGNETIC LIMIT SWITCHES* *N°*.....
☐ *POTENTIOMETER* *TYPE* .....
☐ *ENCODER* *TYPE* .....
☐ ALTRO *OTHER* *Advise* .....

*REAR END:* *TYPE* .....

*(see more info on catalogue)*

*FRONT END:* *TYPE* .....

*(see more info on catalogue)*

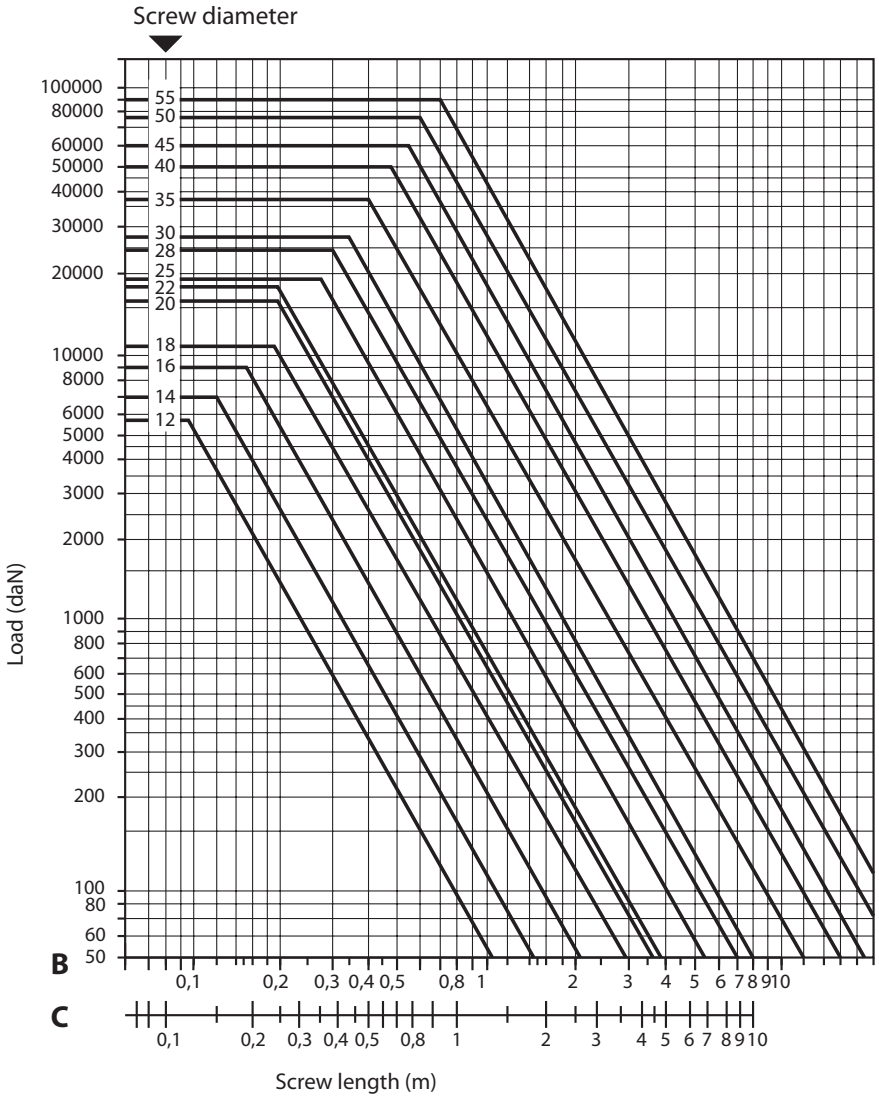
*OPTIONS:*

*(see more info on catalogue)*

☐ *ANTI-ROTATION DEVICE*
☐ *SAFETY NUT*
☐ *STAINLESS STEEL LEAD SCREW*
☐ *BELLOWS BOOT*
☐ *PAINTING*
☐ *OTHER (advise)* .....
☐ *NAKED SCREW*
☐ *BRONZE WORMWHEEL*
☐ *DELRIN (PLASTICS) WORMWHEEL*
☐ *VITON SEALS (FOR HI-TEMP DUTIES)*

**For selection/quotation request, please send e-mail to info@mecvel.com**

**DIAGRAM 1**




The diagram shows how to see what's max load admitted bya lead screw, basing upon its length and upon how actuator will be fixed on frame.
As a general rule, choice is:

| **Actuator series** | ***Diagram*** |
|---|---|
| *Actuator with stroke 15-20 time lower than lead screw diameter* | **C** |
| *Actuator with stroke 15-20 time larger than lead screw diameter* | **B** |

**NOTES**

**NOTES**

## ALI1 Model CE

- Permanent magnet motor 12 - 24 Vdc
- Double worm gearbox
- ACME lead screw
- Aluminum push rod (Stainless steel on request)
- Permanent grease lubrication
- IP 65, tested according to rule CEI EN 60529
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a 30°C*
- Encoder on request
- Limit switches on request (ALI1-PF)

(*) For any special duty please contact our technical dept.


| | ALI1 (Vdc) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) | *Max Current for Fmax(A) 24Vdc* | ** |
| * | 95 | 90 | M12 | 40S | - | 6300 | 2,8 | |
| * | 190 | 90 | M13 | 40L | - | 6000 | 4,5 | |
| * | 130 | 60 | M10 | 40S | - | 6300 | 3,1 | |
| * | 270 | 60 | M11 | 40L | - | 6000 | 6 | |
| * | 200 | 45 | M07 | 40S | - | 6300 | 2,6 | |
| * | 400 | 45 | M09 | 40L | - | 6000 | 3,1 | |
| | 290 | 30 | M04 | 40S | - | 6300 | 2,8 | |
| | 580 | 30 | M06 | 40L | - | 6000 | 4,5 | |
| | 500 | 15 | M01 | 40S | - | 6300 | 2,7 | |
| | 1200 | 15 | M03 | 40L | - | 6000 | 5 | |

* When speed is more than30 mm/s and/or strokes longer than 200 mm, check STROKE SETUP section.

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

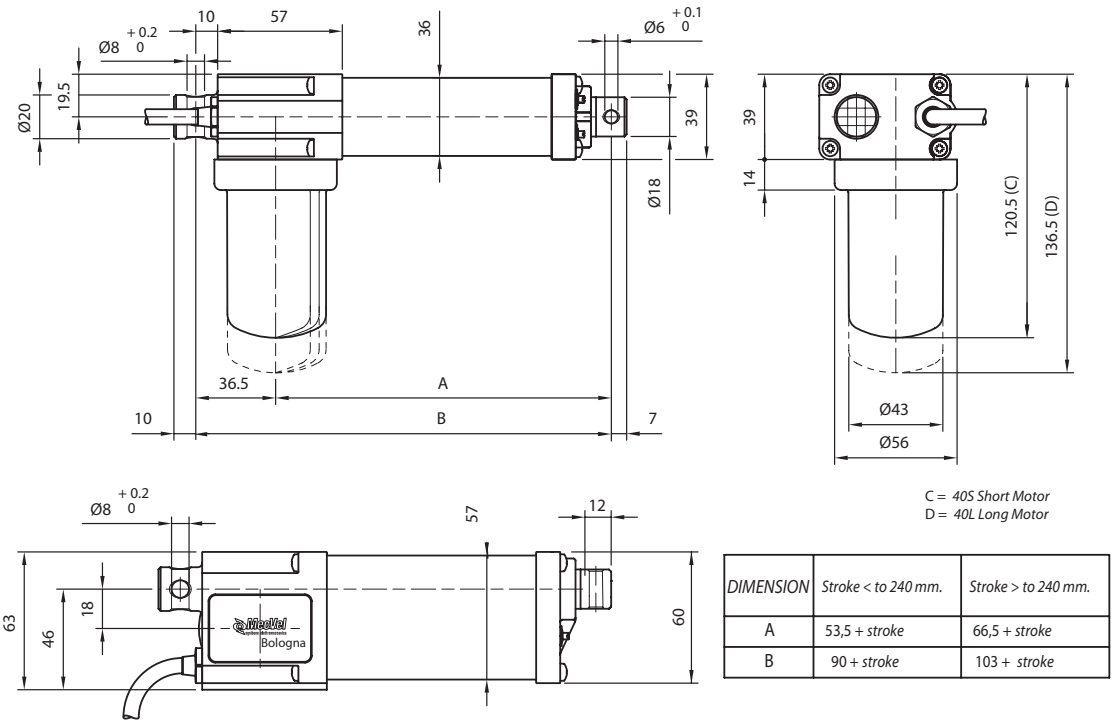
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI1-F ) OR PUT THEM ON MACHINE/FRAME.

MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

## ALI1




C = 40S Short Motor
D = 40L Long Motor

| DIMENSION | Stroke < to 240 mm. | Stroke > to 240 mm. |
|---|---|---|
| A | 53,5 + stroke | 66,5 + stroke |
| B | 90 + stroke | 103 + stroke |

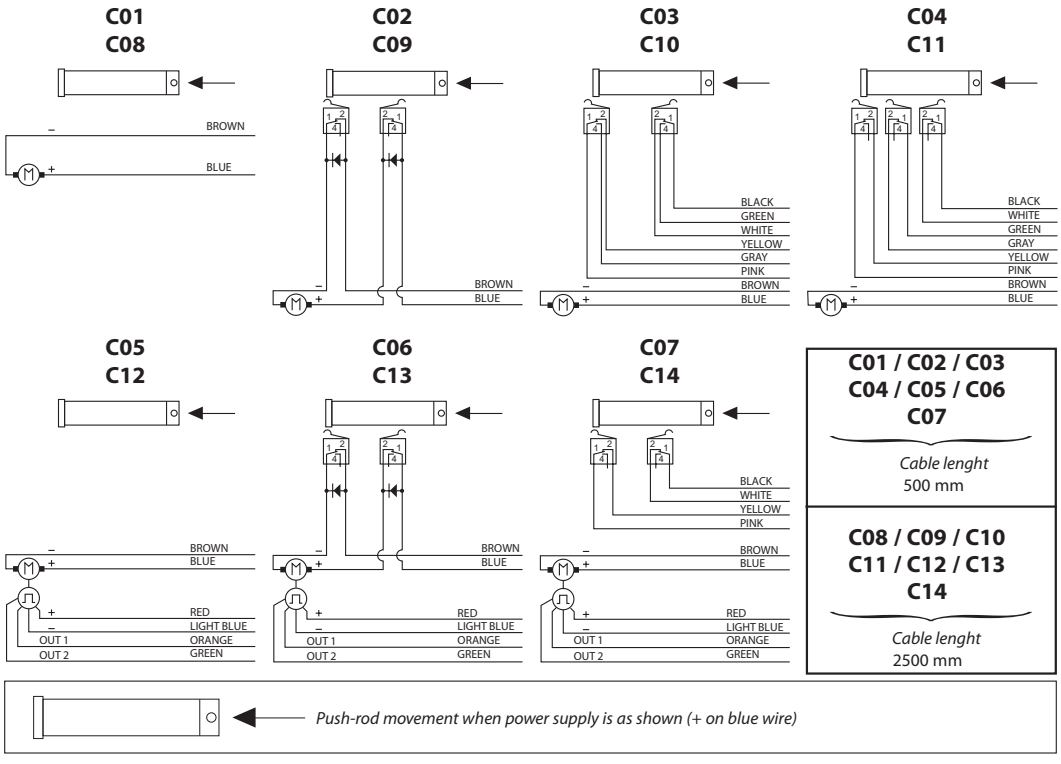
### ELECTRICAL WIRINGS

Options available:

C01/C08 = motor
C02/C09 = N° 2 microswitches,diode-wired
C03/C10 = motor + N° 2 micro
C04/C11 = motor + N° 3 micro
C05/C12 = motor + encoder
C06/C13 = N° 2 micro diode wired + encoder
C07/C14 = motor + N° 2 micro + encoder
C00 = special wiring (Presence of not standard options)

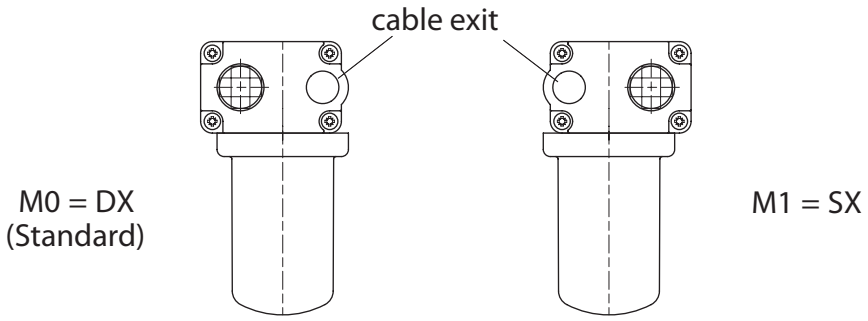
### WARNING:

Micros are actuated by a cam lying on push-rod itself. Micro signal, for speeds higher than 30 mm/s, needs to be handled in its very impulse (I.E.when actuated) and not in its state.
Alternatively, MecVel can add a bush to keep the microswitch lever pressed for a longer time avoiding switch signal mistakes, but cause loss of 10 mm of stroke.
Connections C02 and C06 make a circuit which stops motor supply, so that the push rod won't overstep the area of the two micros.
This system can work only if inertia generated by the actuator and load connected to it does not allow to over-step the micro when stroke is over.
So, this works just with low speeds (M01 - M03), with a load opposing the ongoing direction of the push rod. If not, relay or PLC solutions, using C03 and C07 connections, are needed..Wiring diagrams of connections above are following:

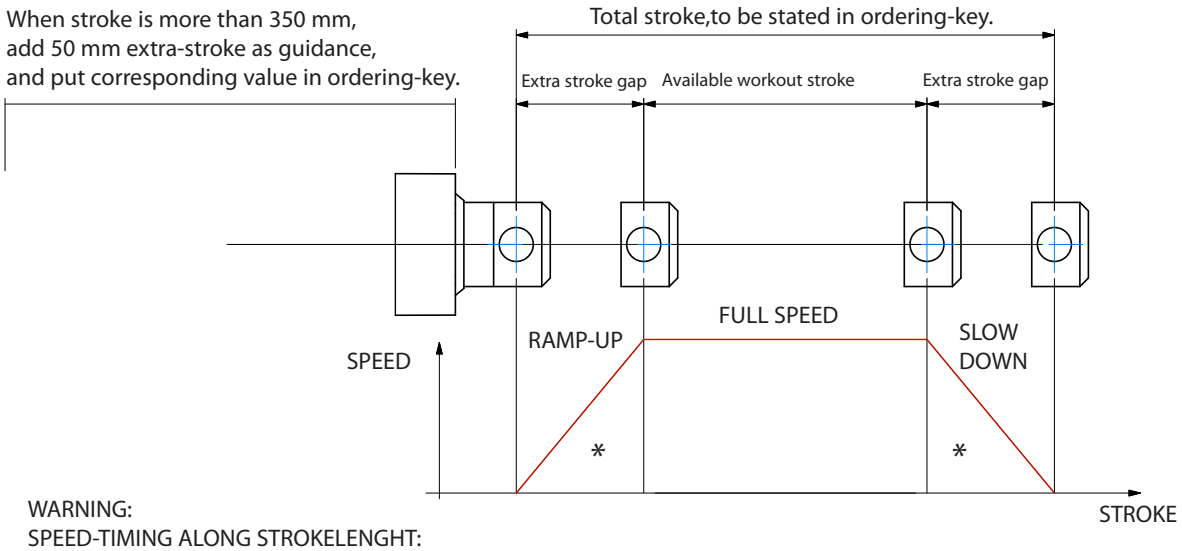


**MOTOR POSITION**

Motor can be installed on both sides of the actuator, thus achieving two versions, as show below.
Actuator is seen from backwards.

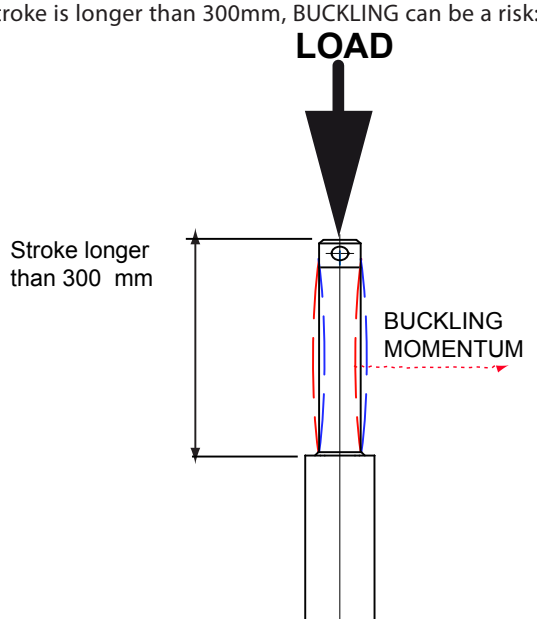



***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is >30 mm/s!!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 300mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.

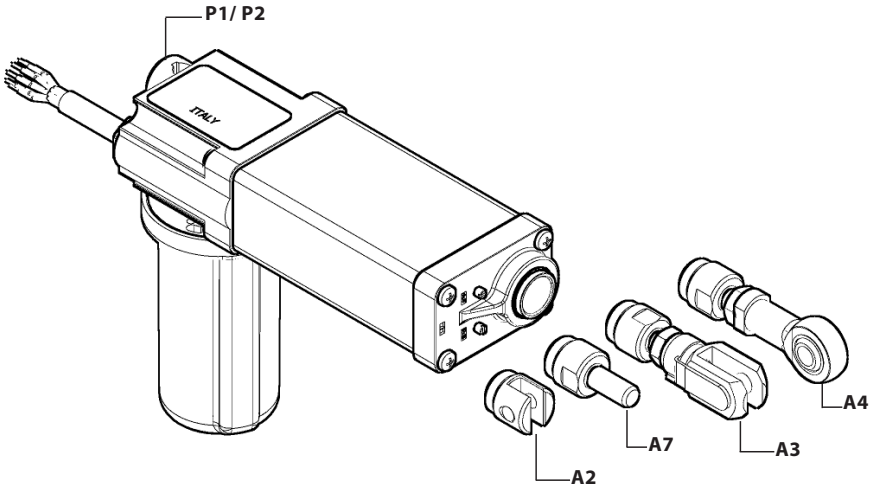


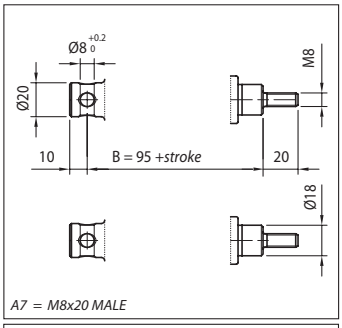

IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

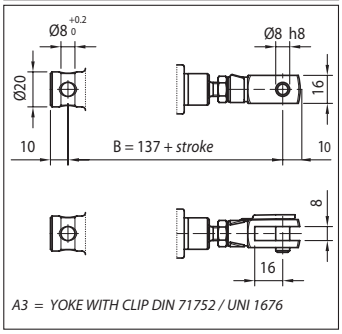
**ALI1F / 0250 / M01 / 12 / M0 / C02 / P1 / A2**

**MODEL:**
ALI1 ALI1-F
**STROKE:**
es. 250 mm = 0250
**VERSION:**
M01 / M03 / M04 / M06 / M07 / M09 / M10 / M11 / M12 / M13
M00 = Not standard speed
**MOTOR:** (available)
**12** = 12 Vdc
**24** = 24 Vdc
**MOTOR POSITION:**
**M0** / **M1**
**MOTOR OPTIONS:**
**C01 / C08:** Motor
**C02 / C09:** 2LS Diode wired
**C03 / C10:** Motor + 2LS
**C04 / C11:** Motor + 3LS
**C05 / C12:** Motor + encoder
**C06 / C13:** 2LS diode wired + encoder
**C07 / C14:** Motor + encoder + 2LS
**C00:** Special wiring (Presence of not standard options)
Note: LS (limit switches)
**REAR END:**
**P0** = None **P1/P2** = standard
**FRONT END:**
**A2** = Yoke( Std pag.14) **A3** = Yoke + Clip
**A4** = Rod end **A7** = M8x20 male
**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**

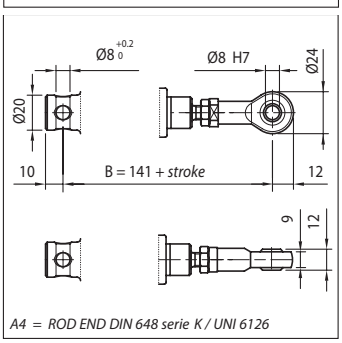


*A7 = M8x20 MALE*



*A3 = YOKE WITH CLIP DIN 71752 / UNI 1676*



*A4 = ROD END DIN 648 serie K / UNI 6126*

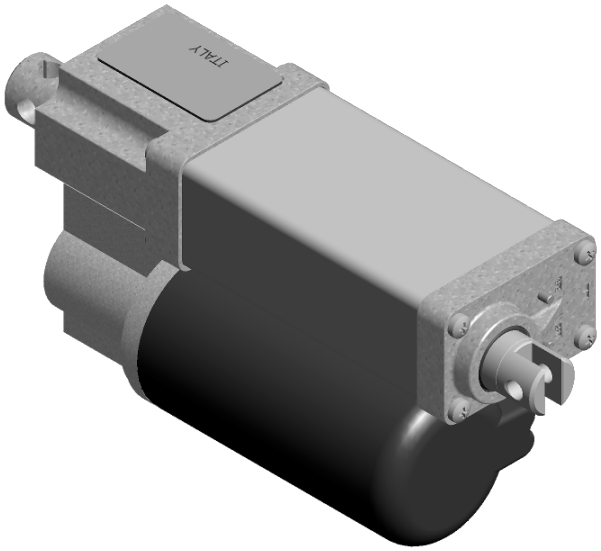
***Note:*** *"B" dimension changes according to model*

ALI1-F = See pictures
ALI1-F stroke > 240 mm = + 13 mm

## ALI1-P Model CE

- Permanent magnet motor 12 - 24 Vdc
- Double worm gearbox
- ACME lead screw
- Aluminum push rod (Stainless steel on request)
- Permanent grease lubrication
- IP 65, tested according to rule CEI EN 60529
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a 30°C*
- Encoder on request
- Limit switches on request (ALI1-PF)

(*) For any special duty please contact our technical dept.



| ALI1-P (Vdc) | | | | | | |
|---|---|---|---|---|---|---|
| ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** | ***Max Current for F max(A) 24Vcc*** ** |
| 1200 | 16.5 | M01 | 40 | - | 6000 | 4,2 |
| 1550 | 11 | M02 | 40 | - | 6000 | 3,8 |
| 2000 | 8.3 | M03 | 40 | - | 6000 | 3,9 |
| 2500 | 5.6 | M04 | 40 | - | 6000 | 3,6 |
| 2500 | 2.8 | M05 | 40 | - | 6000 | 2,8 |
| 2500 | 0.9 | M06 | 40 | - | 6000 | 1,8 |

When stroke is longer than 200 mm, check STROKE SETUP section.

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

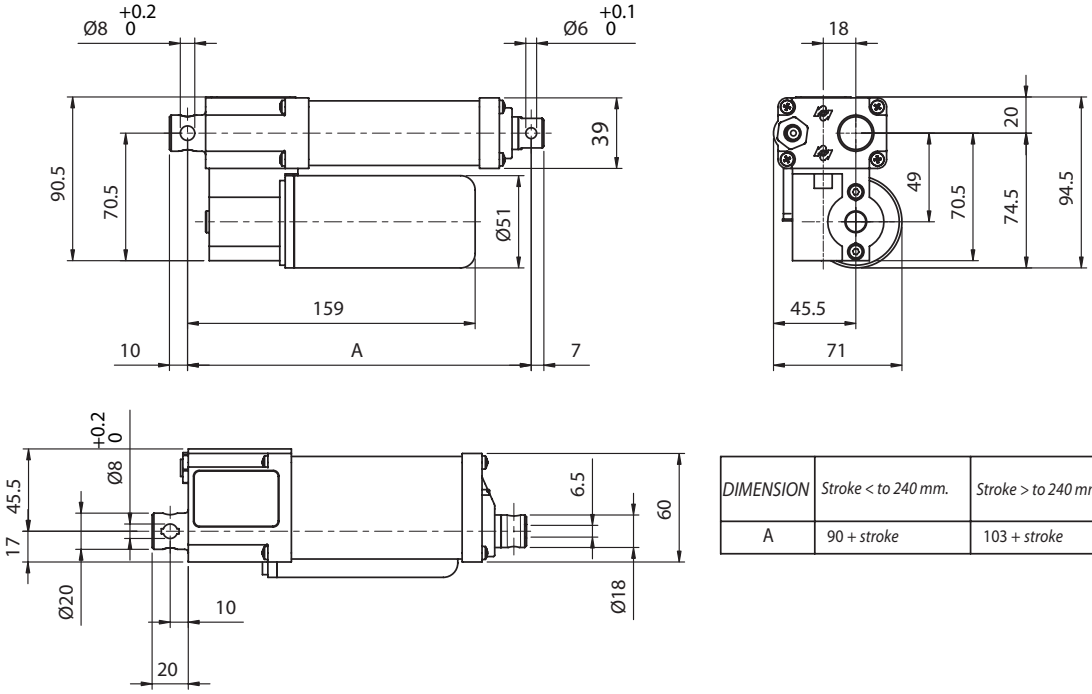
BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO AVOID **FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI1-PF) OR PUT THEM ON MACHINE/FRAME.

## ALI1-P




| DIMENSION | Stroke < to 240 mm. | Stroke > to 240 mm. |
|---|---|---|
| A | 90 + stroke | 103 + stroke |

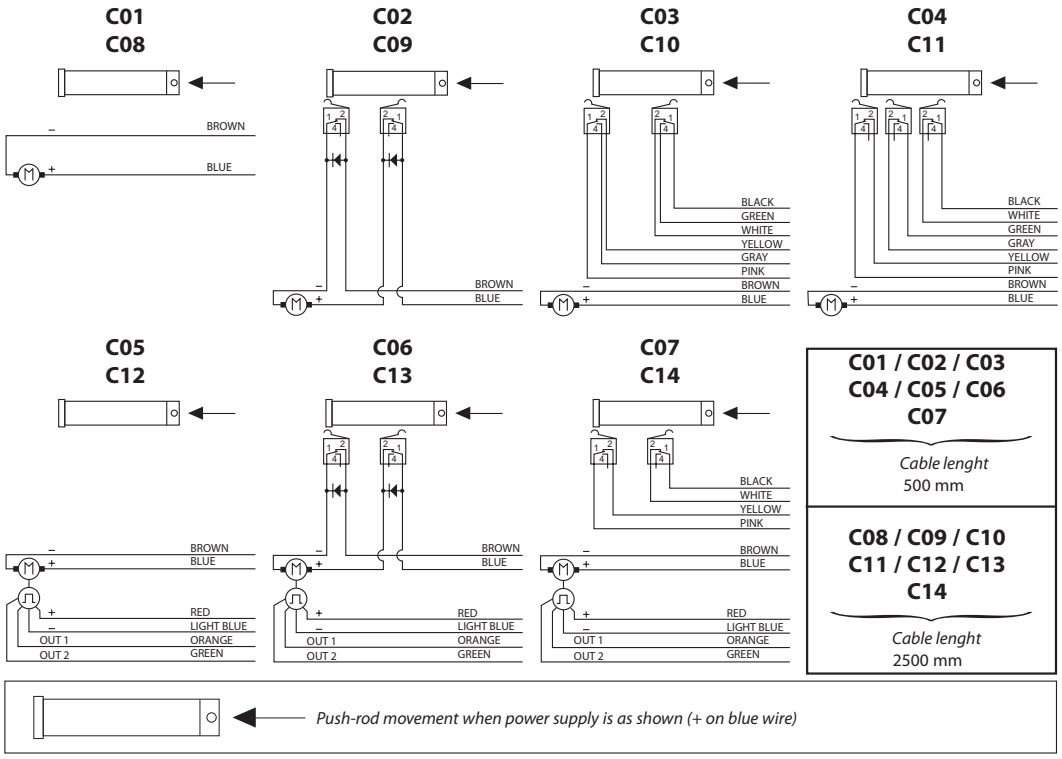
### ELECTRICAL WIRINGS

Options available:

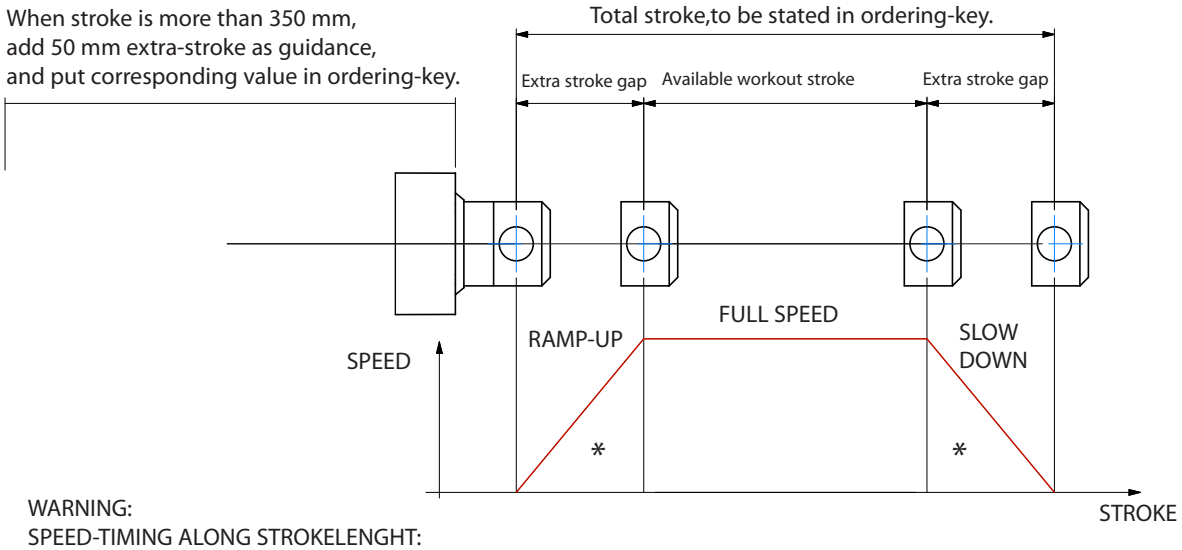
C01/C08 = motor
C02/C09 = N° 2 microswitches,diode-wired
C03/C10 = motor + N° 2 micro
C04/C11 = motor + N° 3 micro
C05/C12 = motor + encoder
C06/C13 = N° 2 micro diode wired + encoder
C07/C14 = motor + N° 2 micro + encoder
C00 = special wiring (Presence of not standard options)

### WARNING:

Micros are actuated by a cam lying on push-rod itself. Micro signal, for high speeds needs to be handled in its very impulse (I.E.when actuated) and not in its state.
Alternatively, MecVel can add a bush to keep the microswitch lever pressed for a longer time avoiding switch signal mistakes, but cause loss of 10 mm of stroke.
Connections C02 and C06 make a circuit which stops motor supply, so that the push rod won't overstep the area of the two micros.
This system can work only if inertia generated by the actuator and load connected to it does not allow to over-step the micro when stroke is over.
So, this works just with low speeds (M01 - M03), with a load opposing the ongoing direction of the push rod. If not, relay or PLC solutions, using C03 and C07 connections, are needed.
Wiring diagrams of connections above are following:

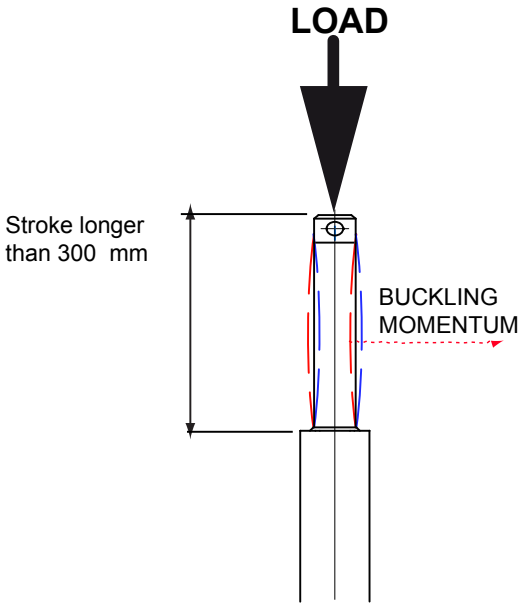


***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important with high speed !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** With strokes longer than 300mm, BUCKLING can be a risk: please check mounting with our offices and/or see usermanuals.




IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

**ALI1P / 0250 / M01 / 12 / M0 / C02 / P1 / A1**

**MODEL:**
ALI1-P (without limit switches) ALI1-PF (with limit switches)

**STROKE:**
es. 250 mm = 0250

**VERSION:** (pag.17)
M01 / M02/ M03 / M04 / M05/ M06
M00 = Not standard speed

**MOTOR:** (available)
**12** = 12 Vdc
**24** = 24 Vdc

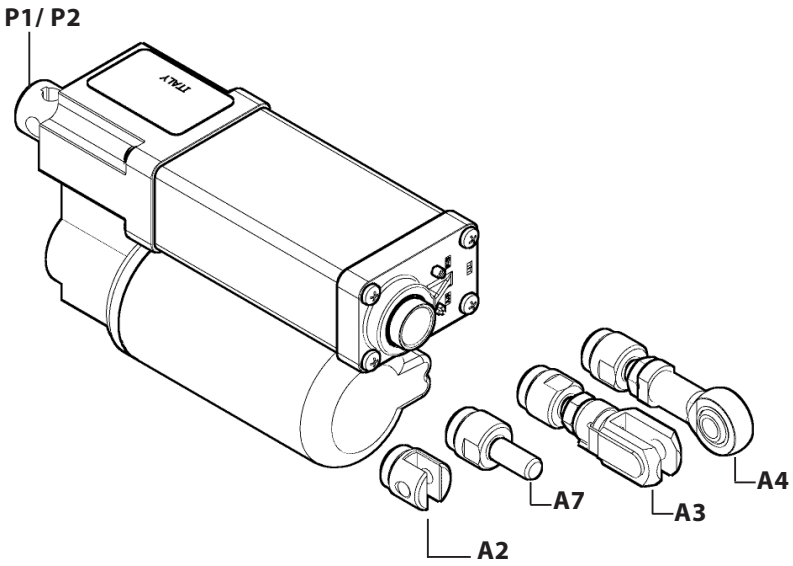
**MOTOR POSITION:**
**M0** / **M1**

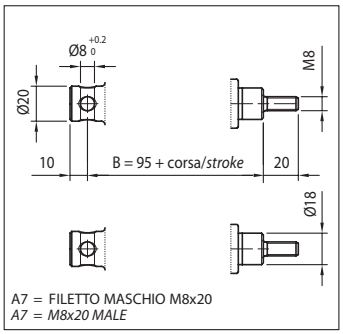
**MOTOR OPTIONS:**
**C01 / C08:** Motore / Motor
**C02 / C09:** 2LS Diode wired
**C03 / C10:** Motor + 2LS
**C04 / C11:** Motor + 3LS
**C05 / C12:** Motor + encoder
**C06 / C13:** 2LS diode wired + encoder
**C07 / C14:** Motor + encoder + 2LS
**C00:** Special wiring (Presence of not standard options)
Note: LS (limit switches)

**REAR END:**
**P0** = None **P1 / P2** = standard

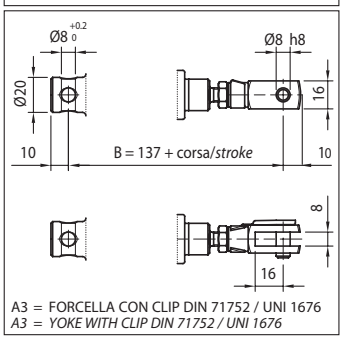
**FRONT END:**
**A2** = Yoke (Std pag.18) **A3** = Yoke + Clip
**A4** = Rod end **A7** = M8x20 male

**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**

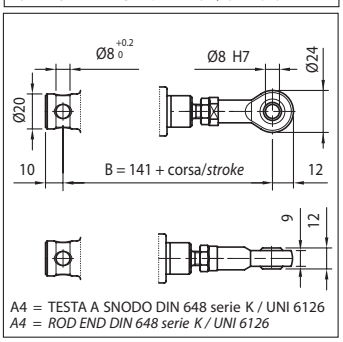



A7 = FILETTO MASCHIO M8x20
*A7 = M8x20 MALE*



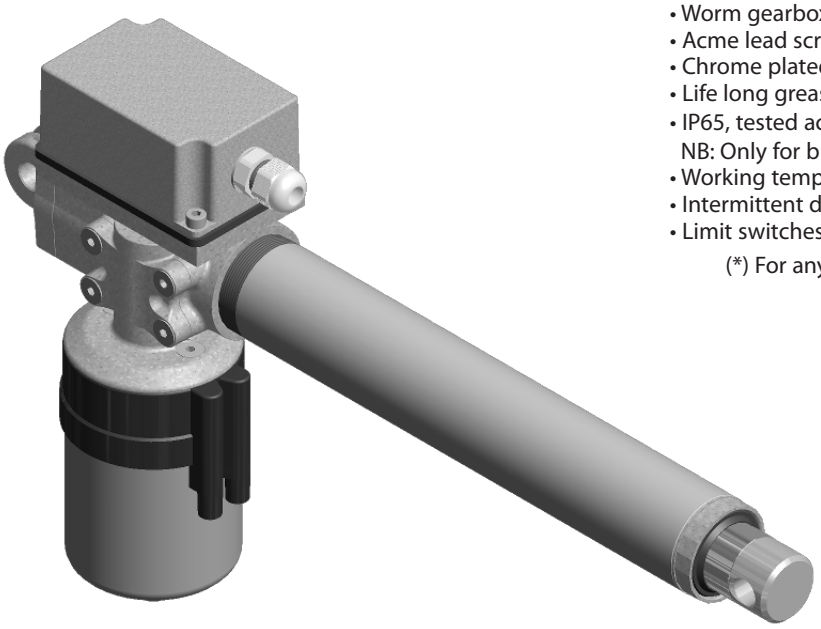

A3 = FORCELLA CON CLIP DIN 71752 / UNI 1676
*A3 = YOKE WITH CLIP DIN 71752 / UNI 1676*




A4 = TESTA A SNODO DIN 648 serie K / UNI 6126
*A4 = ROD END DIN 648 serie K / UNI 6126*

***Note:*** *"B" dimension changes according to model*

ALI1-PF = See pictures
ALI1-PF stroke > 240 mm = + 13 mm



## ALI2 Model CE

- Permanent magnet motor CE
- Three phase or single phase motor CE
- Worm gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Life long grease lubricated
- IP65, tested according to rule CEI EN 60529
  NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a +30°C*
- Limit switches, potentiometer and encoder on request

(*) For any special duty please contact our technical dept.

**ALI2 (Vac 3-phase)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 450 | 110 | M01 | IEC50 | 0.09 | 2800 |
| * | 500 | 70 | M02 | IEC50 | 0.09 | 2800 |
| * | 650 | 50 | M03 | IEC50 | 0.09 | 2800 |
| * | 850 | 40 | M04 | IEC50 | 0.09 | 2800 |
| | 1000 | 30 | M05 | IEC50 | 0.06 | 1400 |
| | 1400 | 20 | M06 | IEC50 | 0.06 | 1400 |
| | 2200 | 10 | M07 | IEC50 | 0.06 | 1400 |
| | 2500 | 5 | M08 | IEC50 | 0.06 | 1400 |

**ALI2 VRS (ballscrew) (Vac 3-phase)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 1500 | 45 | M01 | IEC50 | 0.09 | 2800 |
| | 1800 | 30 | M02 | IEC50 | 0.09 | 2800 |
| | 2000 | 20 | M03 | IEC50 | 0.06 | 1400 |
| | 2500 | 10 | M04 | IEC50 | 0.06 | 1400 |
| | 2500 | 5 | M05 | IEC50 | 0.06 | 1400 |

**ALI2 (Vdc)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) | Max Current for F max(A) 24Vdc | |
|---|---|---|---|---|---|---|---|---|
| * | 800 | 110 | M08 | 61.5 | - | 3000 | 13 | ** |
| * | 850 | 70 | M09 | 61.5 | - | 3000 | 9 | |
| * | 1100 | 55 | M10 | 61.5 | - | 3000 | 9,5 | |
| * | 1500 | 40 | M11 | 61.5 | - | 3000 | 11 | |
| | 2000 | 30 | M12 | 61.5 | - | 3000 | 10,5 | |
| | 2500 | 20 | M13 | 61.5 | - | 3000 | 10,5 | |
| | 2500 | 10 | M14 | 61.5 | - | 3000 | 9,5 | |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

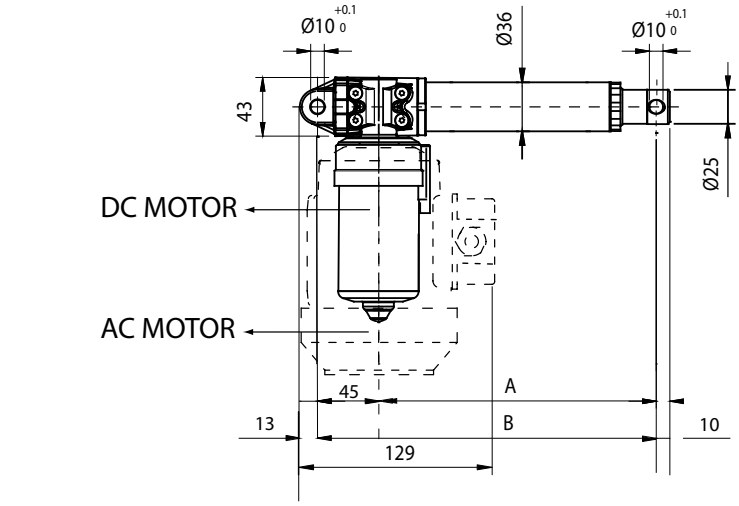
BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

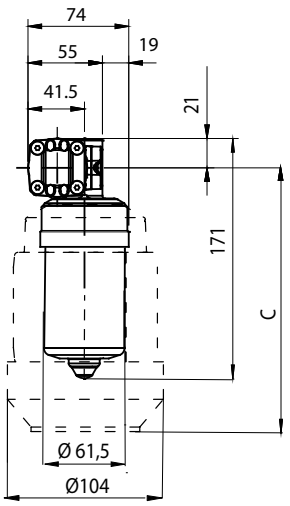
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

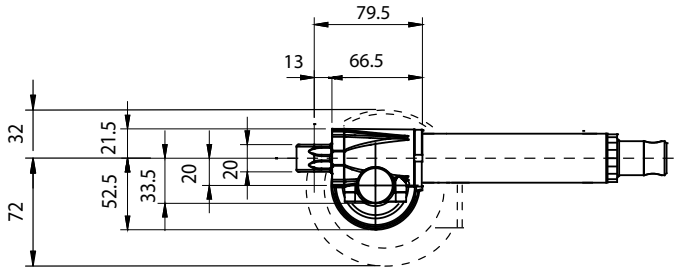
ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI2-F or ALI2-FCM) OR PUT THEM ON MACHINE/FRAME.

## ALI2 Version without limitswitches



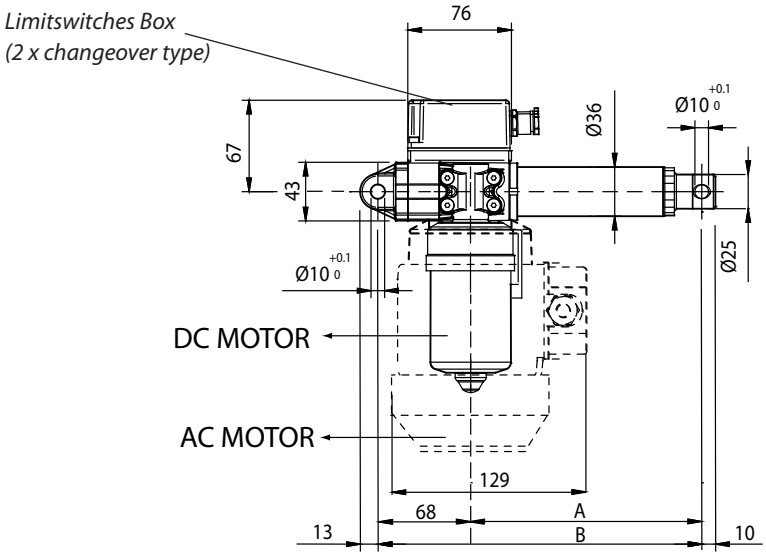



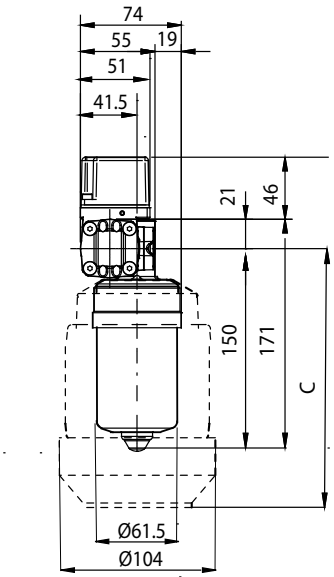



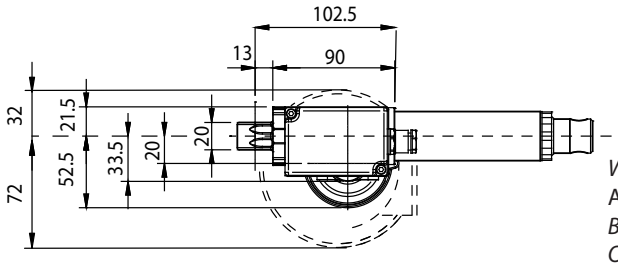

| DIMENSION | Stroke < to 320 mm | Stroke > to 320 mm |
|---|---|---|
| A | 70 + stroke | 80 + stroke |
| B | 115 + stroke | 125 + stroke |
| C with brake | 220.5 | |
| C without brake | 182.5 | |

*With safety nut "G" = + 30 mm*
ALI2-VRS = + 40 mm ( safety nut unavailable)
*Bellows* + 20mm (*for FCM limitswitches contact our Offices*)

## ALI2-F Version with limitswitches



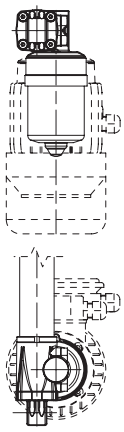



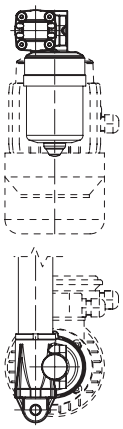



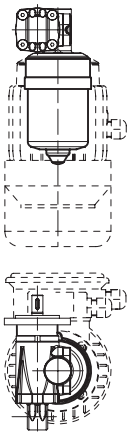

| DIMENSION | Stroke < to 320 mm | Stroke > to 320 mm |
|---|---|---|
| A | 70 + stroke | 80 + stroke |
| B | 138 + stroke | 148 + stroke |
| C with brake | 220.5 | |
| C without brake | 182.5 | |

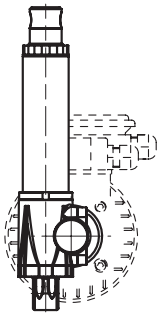
*With safety nut "G" = + 30 mm*
ALI2-F-VRS = + 40 mm ( safety nut unavailable)
*Bellows* + 20mm (*for FCM limitswitches contact our Offices*)

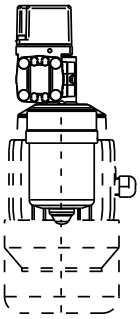
**REAR ENDS** **MOTOR POSITION** **E-BOX POSITION** **LIMIT SWITCHES POSITION**


P1 Standard

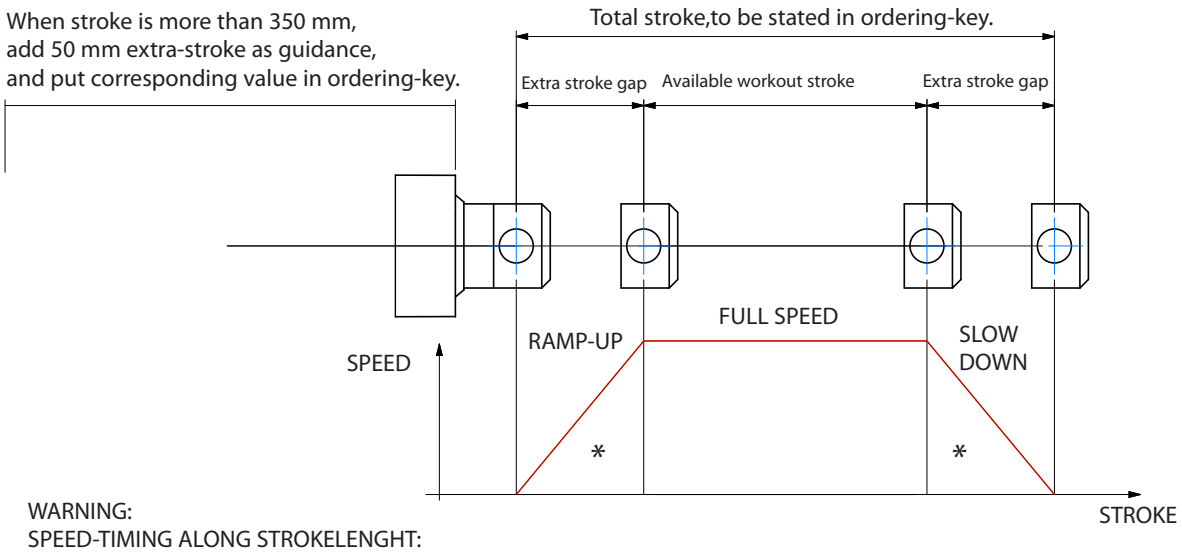

P2 Rotated 90°


M0


1 Standard

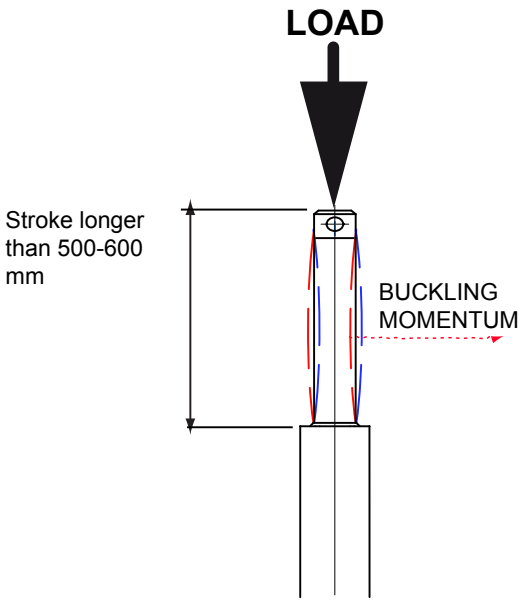

FC1 (Standard) M0

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is > 40mm/s !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.




IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

**ALI2 / 0250 / M01 / CA-400/50-T-50-4-0,09 / AB / M0 / 1 / E01 / 2FC1 / P0T01A / FC1 / P1 / A1**

**MODEL:**
ALI2 / ALI2-F / ALI2-VRS / ALI2-F- VRS / ALI2-FCM

**STROKE:**
es. 250 mm = 0250
min 50; with 50 as incremental

**VERSION:** (pag.21)
M08 /M09 / M10 / M11 / M12 / M13 / M14 (version C.C.)
M01 / M02 / M03 / M04 / M05 / M06 / M07 / M08 M09 / M10 (version C.A)

**MOTOR:** (Pag. ACCESSORIES)
Advise only if with motor:
**A.C**: version, voltage, type, size, n°pole, power
**D.C.**: version, voltage, size, Rpm

**AC MOTOR OPTIONS:** (Pag. ACCESSORIES)
No motor or DC motor: leave all following parameters blank
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)

**MOTOR POSITION:**
**M0** None: Leave blank

**E-BOX POSITION:**
**1**

**ENCODER:** (Pag. ACCESSORIES)
None: Leave blank

**LIMIT SWITCHES:** (Pag. ACCESSORIES)
**2FC1** None: Leave blank

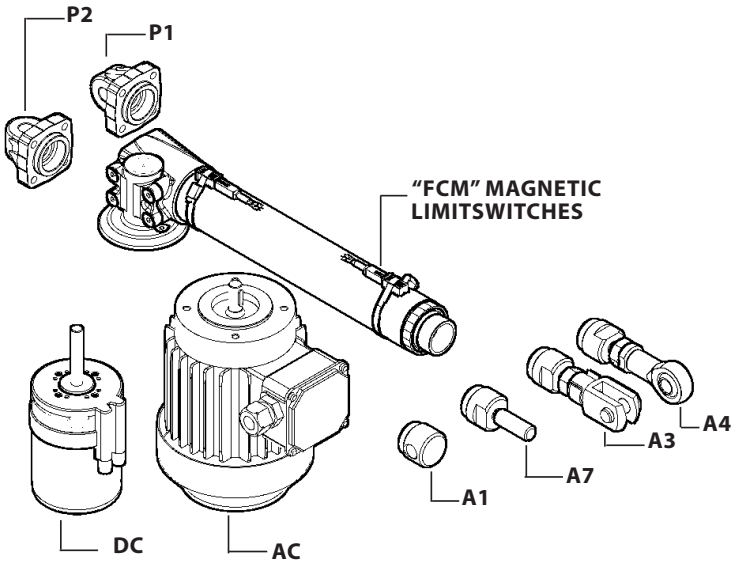
**POTENTIOMETER:** (Pag. ACCESSORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) None: / Leave blank

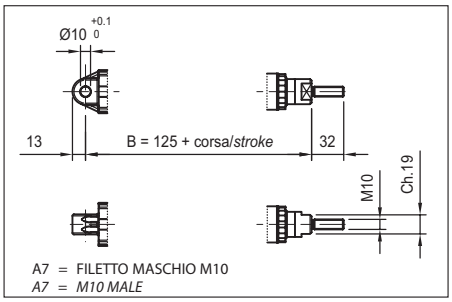
**LIMIT SWITCHES POSITION:**
**FC1** None: Leave blank

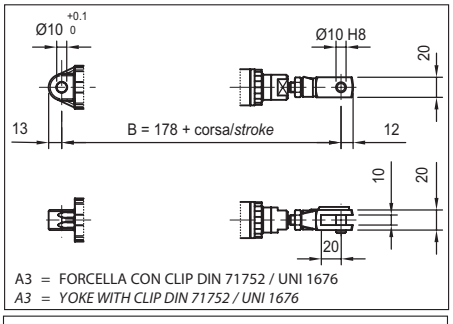
**REAR END:**
**P1** = Eyelet (standard) **P2** = Eyelet (90°)

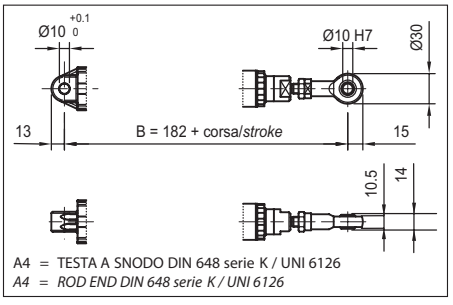
**FRONT END:**
**A1** = Eyelet (Std pag.22) **A3** = Yoke + Clip
**A4** = Rod end **A7** = M10 male

**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**



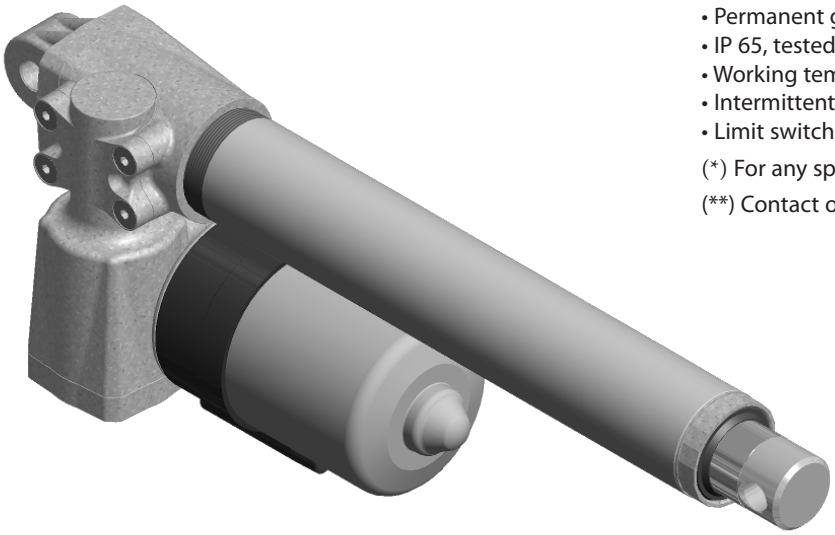




***Note:*** *"B" dimension changes according to model*

ALI2 = See pictures
ALI2 stroke > 320 mm = + 10 mm
ALI2-FCM = + 34 mm
ALI2-FCM stroke > 320 mm = +44
ALI2-F = + 23 mm
ALI2-F stroke > 320 mm = + 33 mm

With safety nut "G" = + 30 mm
ALI2-VRS = + 40 mm
ALI2-F-VRS = + 63 mm
Bellows + 20mm



## ALI2-P Model CE

- Permanent magnet motor CE
- Double worm gearbox
- Acme lead screw or ballscrew (VRS)(**)
- Chrome plated steel push rod
- Permanent grease lubrication
- IP 65, tested according to rule CEI EN 60529
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a 30°C*
- Limit switches, potentiometer and encoder on request

(*) For any special duty please contact our technical dept.

(**) Contact our technical dept.

| ALI2-P (Vdc) | | | | | | |
|---|---|---|---|---|---|---|
| ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor Power* (KW)** | ***Motor speed* (rpm)** | ***Max Current for F max(A) 24Vdc*** ** |
| 2400 | 30 | M01 | 61.5 | - | 4000 | 8,2 |
| 2600 | 20 | M02 | 61.5 | - | 4000 | 7,8 |
| 3000 | 15 | M03 | 61.5 | - | 4000 | 6 |
| 4200 | 10 | M04 | 61.5 | - | 4000 | 7 |
| 4200 | 7 | M05 | 61.5 | - | 4000 | 5,8 |
| 4200 | 5 | M06 | 61.5 | - | 4000 | 4,8 |
| 4200 | 2.5 | M07 | 61.5 | - | 4000 | 3,2 |
| 4200 | 1.2 | M08 | 61.5 | - | 4000 | 2,6 |
| 4200 | 0.6 | M09 | 61.5 | - | 4000 | 1,8 |

When stroke is longer than 350mm, check STROKE SETUP section.

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

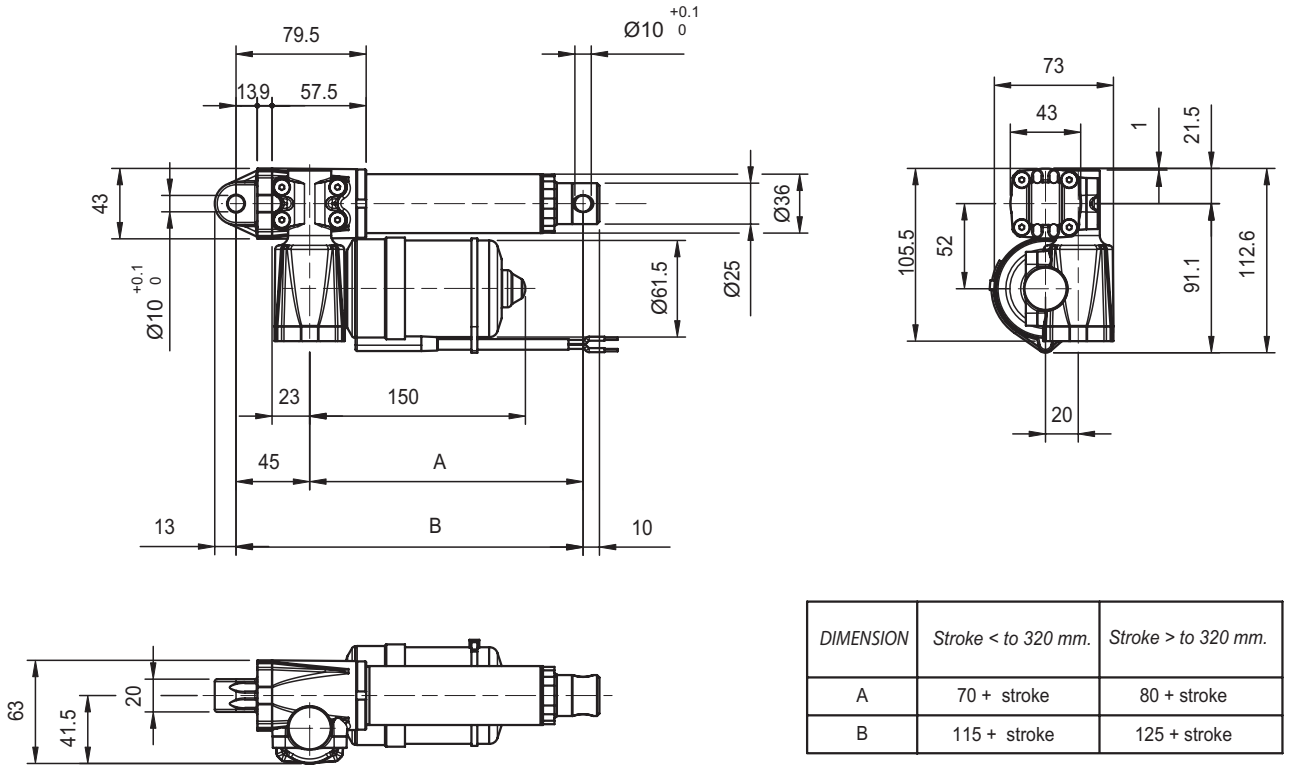
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO AVOID **FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI2-F or ALI2-FCM) OR PUT THEM ON MACHINE/FRAME.

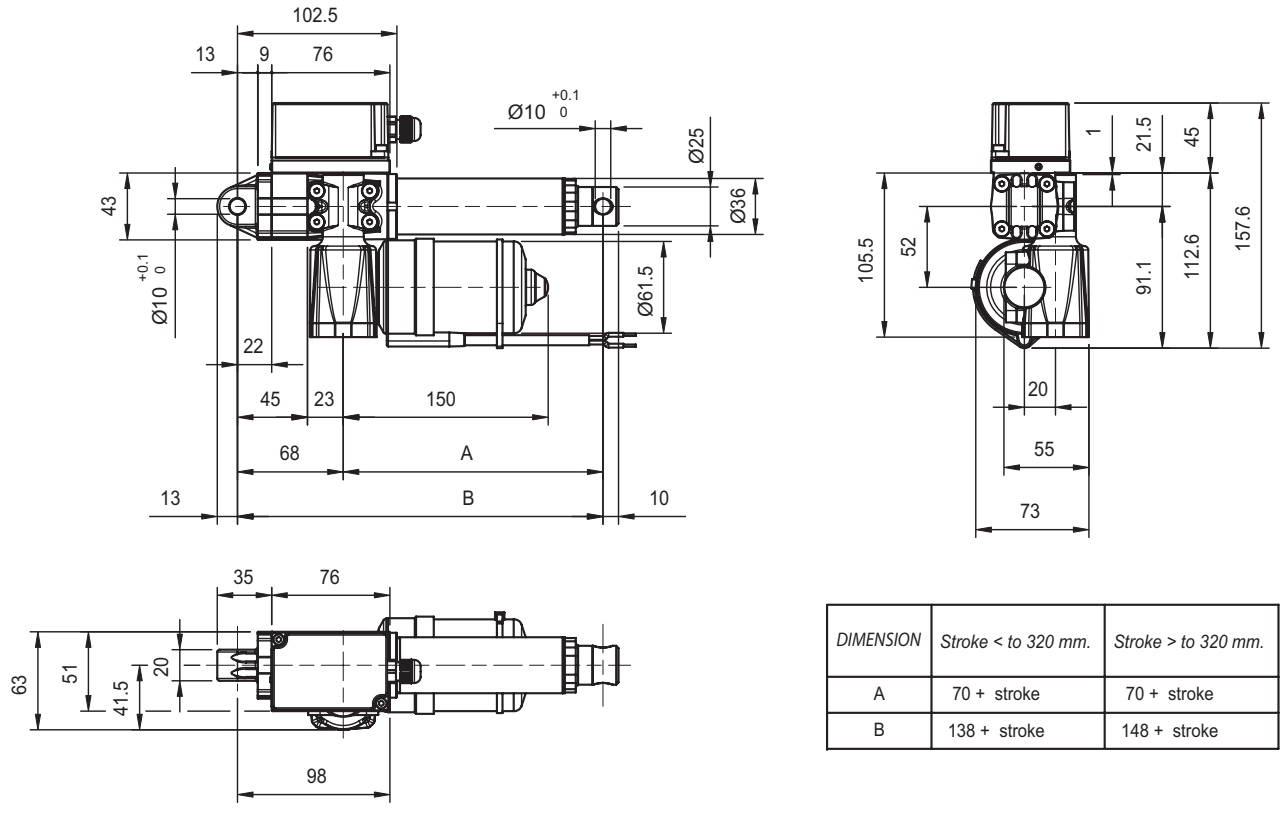
⚠ MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

## ALI2-P Version without limitswitches



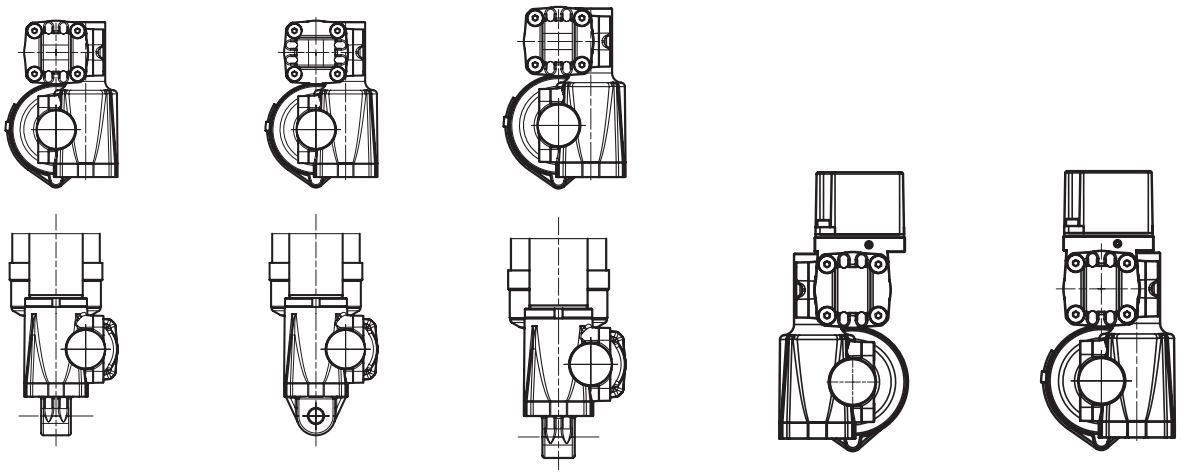

| DIMENSION | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|
| A | 70 + stroke | 80 + stroke |
| B | 115 + stroke | 125 + stroke |

## ALI2-P-F *Version with limitswitches*



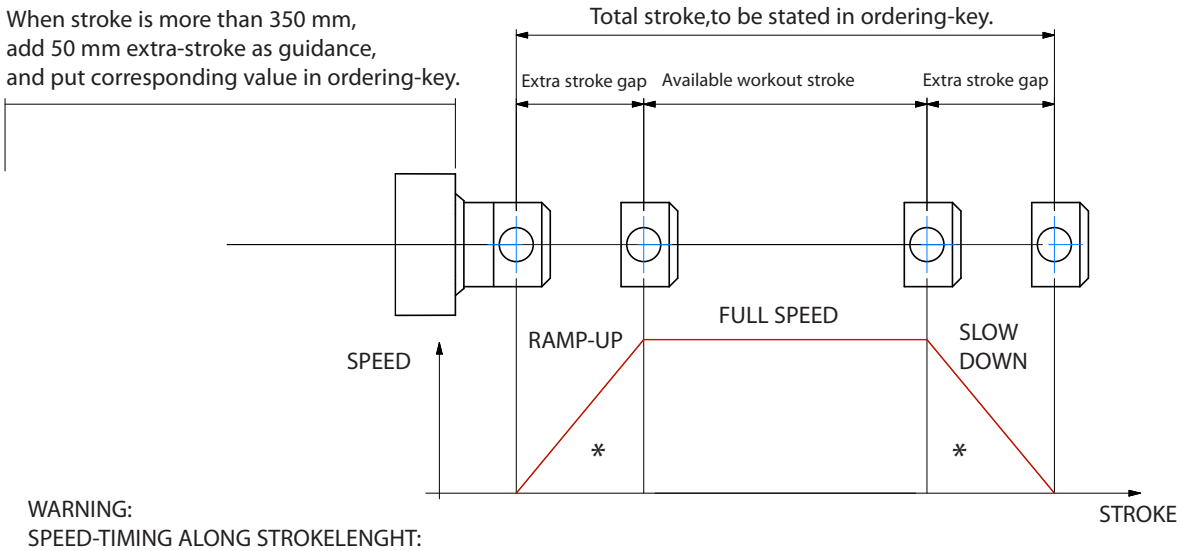

| DIMENSION | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|
| A | 70 + stroke | 70 + stroke |
| B | 138 + stroke | 148 + stroke |

**REAR ENDS** | **MOTOR POSITION** | **MOTOR AND LIMIT SWITCHES POSITION**



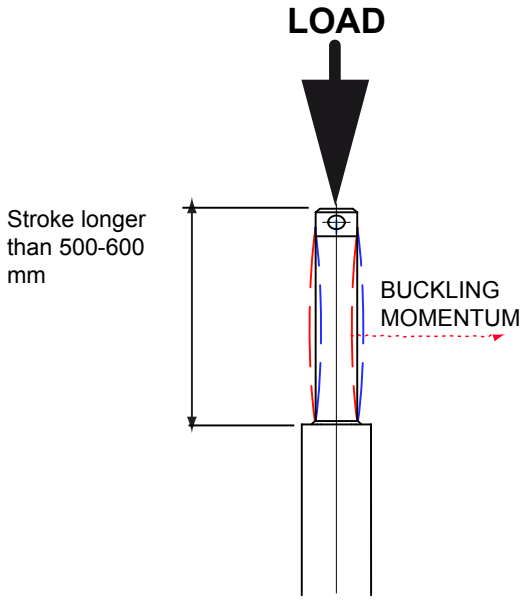
P1 Standard | P2 Rotated 90° | M0 | M1 FC1 | M0 FC1

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important with high speed !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** With strokes longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see usermanuals.

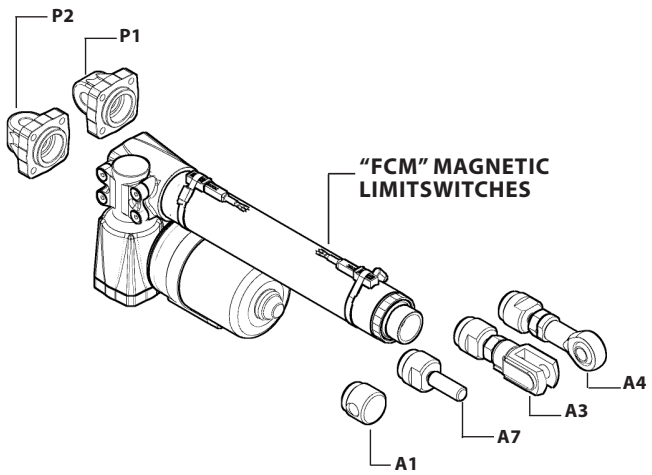


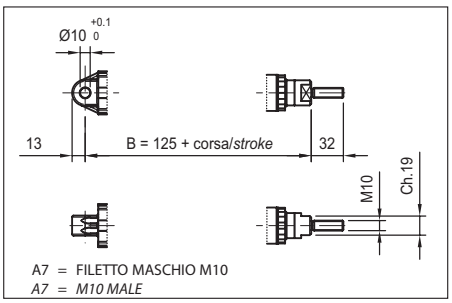

IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

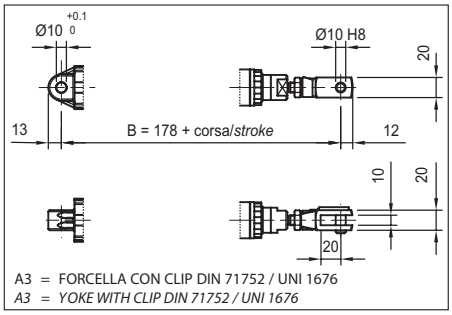
## ORDERING KEY

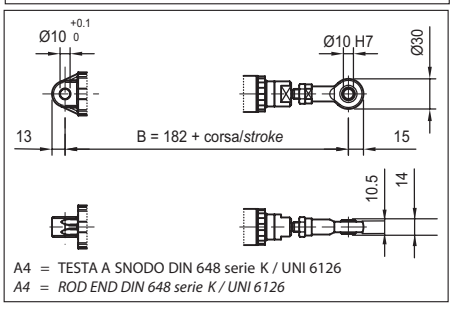
**ALI2P / 0250 / M01 / 61,5-24 / 2FC1 / P0T01A / E01 / M0FC1 / P1 / A1**

**MODEL:**
ALI2-P ALI2-PF
ALI2-P-FCM
**STROKE:**
es. 250 mm = 0250
**VERSION:** (pag.25)
M01 / M02 / M03 / M04 / M05 / M06 / M07 / M08 / M09
M00 = Not standard speed
**MOTOR:** (available)
**12** = 12 Vcc
**24** = 24 Vcc
**LIMIT SWITCHES:** (Pag. ACCESORIES)
None: Leave blank
**POTENTIOMETER:** (Pag. ACCESORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) *None: / Leave blank*
**ENCODER:** (Pag. ACCESORIES)
None: Leave blank
**LIMIT SWITCHES POSITION:** (Pag. ACCESORIES)
**M0FC1** **M1FC1** None: Leave blank
**REAR END:**
**P1** = Eyelet (standard) **P2** = Eyelet (90°)
**FRONT END:**
**A1** = Eyelet (Std pag.28) **A4** = Rod end
**A3** = Yoke + Clip **A7** = M10 male
**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION.**



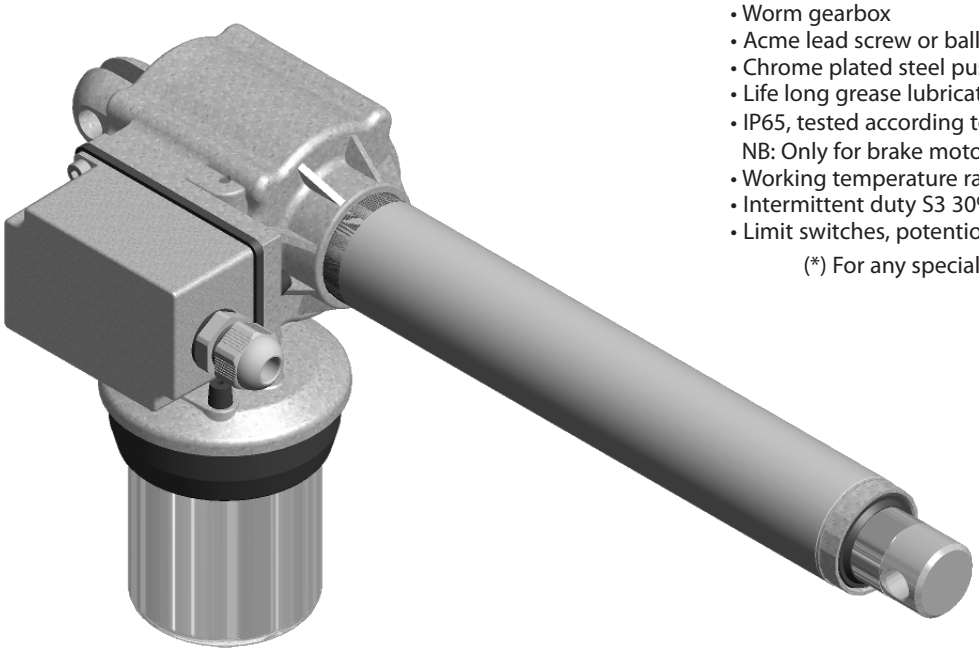




***Note:*** *"B" dimension changes according to model*

ALI2-P= See pictures
ALI2-P stroke > 320 mm = + 10 mm
ALI2-PF = + 23 mm
ALI2-PF stroke > 320 mm = +33
ALI2-P-FCM = + 33 mm
ALI2-P-FCM stroke > 320 mm = +43 mm

With safety nut "G" = + 30 mm
Bellows = + 20mm



## ALI3 Model CE

- Permanent magnet motor CE
- Three phase or single phase motor CE
- Worm gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Life long grease lubricated
- IP65, tested according to rule CEI EN 60529
  NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a +30°C*
- Limit switches, potentiometer and encoder on request

(*) For any special duty please contact our technical dept.

**ALI3 (Vac 3-phase)**

| *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) |
|---|---|---|---|---|---|
| 2600 | 20 | M01 | IEC50 | 0.09 | 2800 |
| 2800 | 14 | M02 | IEC50 | 0.09 | 2800 |
| 4800 | 7 | M03 | IEC50 | 0.09 | 2800 |
| 5000 | 5 | M04 | IEC50 | 0.09 | 2800 |
| 5000 | 2.5 | M05 | IEC50 | 0.06 | 2800 |

**ALI3 (Vdc)**

| *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) | *Max Current for F max(A) 24Vdc* |
|---|---|---|---|---|---|---|
| 3600 | 35 | M01 | 61.5 | - | 5000 | 13 |
| 3600 | 25 | M02 | 61.5 | - | 5000 | 9 |
| 6000 | 12 | M03 | 61.5 | - | 5000 | 10 |
| 6000 | 9 | M04 | 61.5 | - | 5000 | 7,6 |
| 6000 | 5 | M05 | 61.5 | - | 5000 | 5,8 |

**

**ALI3 VRS (ballscrew) (Vac 3-phase)**

| *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) |
|---|---|---|---|---|---|
| 5000 | 9 | M01 | IEC50 | 0.09 | 2800 |
| 5000 | 3,5 | M02 | IEC50 | 0.09 | 2800 |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

When stroke is longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

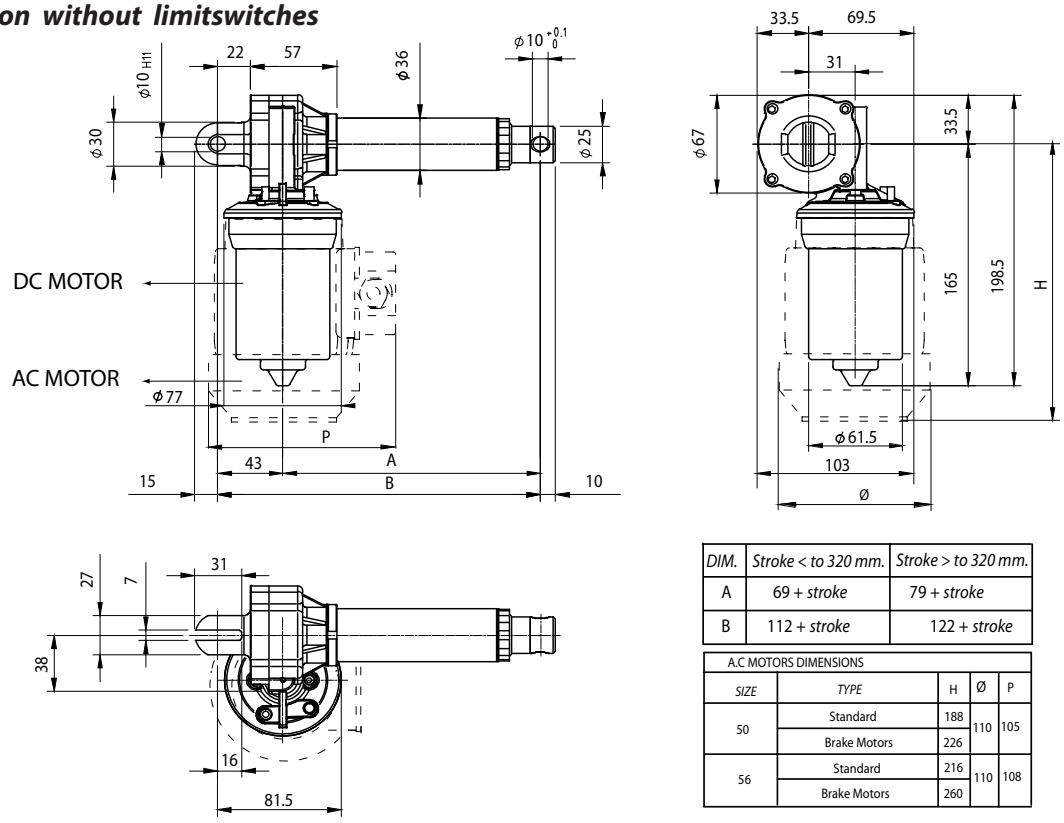
BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO AVOID **FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI3-F or ALI3-FCM) OR PUT THEM ON MACHINE/FRAME.

## ALI3 *Version without limitswitches*

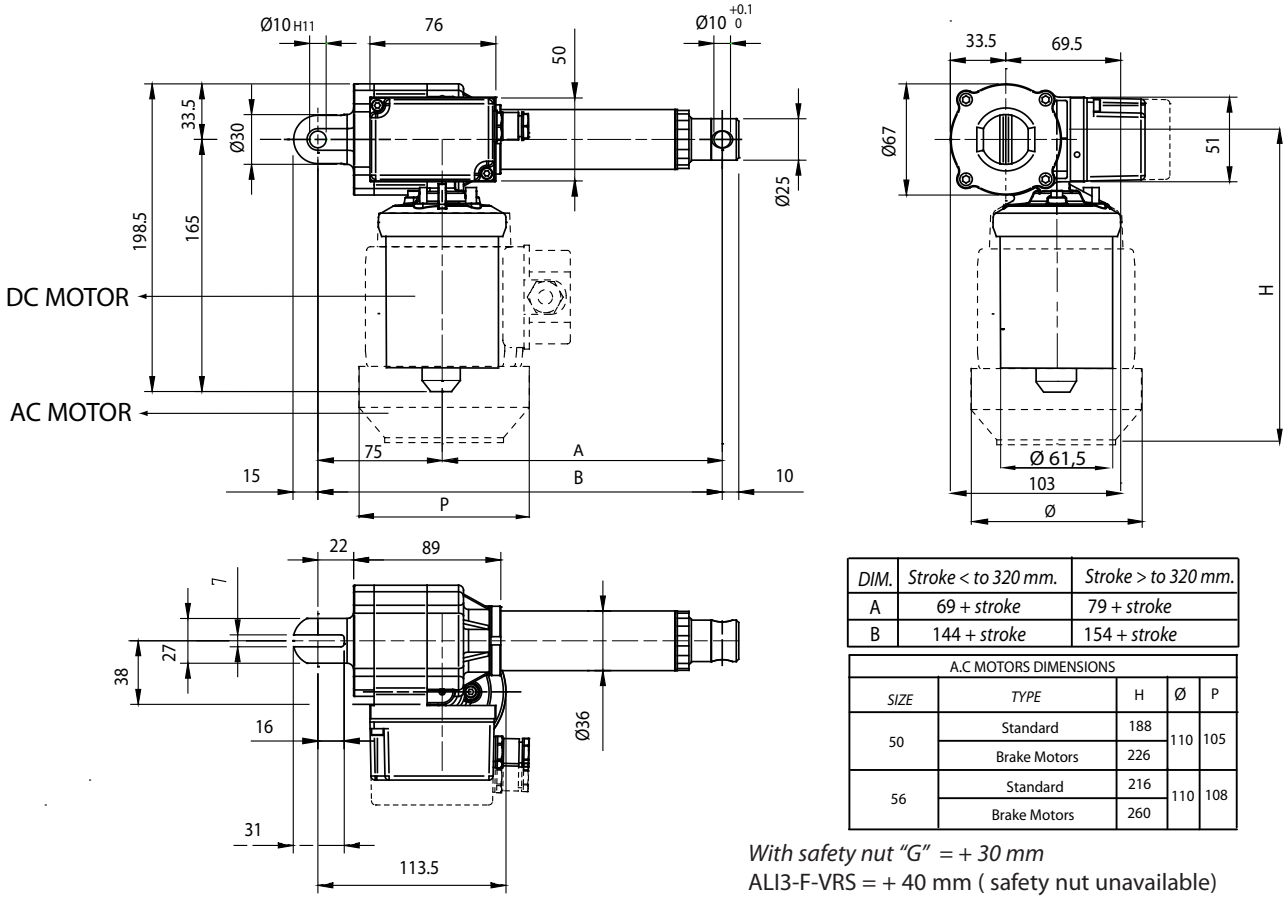



| DIM. | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|
| A | 69 + stroke | 79 + stroke |
| B | 112 + stroke | 122 + stroke |

| A.C MOTORS DIMENSIONS | | | | |
|---|---|---|---|---|
| SIZE | TYPE | H | Ø | P |
| 50 | Standard | 188 | 110 | 105 |
| | Brake Motors | 226 | | |
| 56 | Standard | 216 | 110 | 108 |
| | Brake Motors | 260 | | |

*With safety nut "G" = + 30 mm*
ALI3-VRS = + 40 mm ( safety nut unavailable)
*Bellows* + 20mm (*for FCM limitswitches contact our Officies*)

## ALI3-F *Version with limitswitches*

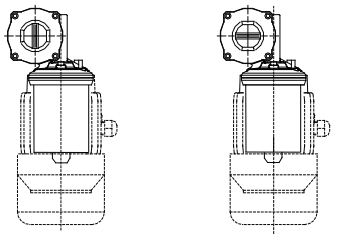



| DIM. | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|
| A | 69 + stroke | 79 + stroke |
| B | 144 + stroke | 154 + stroke |

| A.C MOTORS DIMENSIONS | | | | |
|---|---|---|---|---|
| SIZE | TYPE | H | Ø | P |
| 50 | Standard | 188 | 110 | 105 |
| | Brake Motors | 226 | | |
| 56 | Standard | 216 | 110 | 108 |
| | Brake Motors | 260 | | |

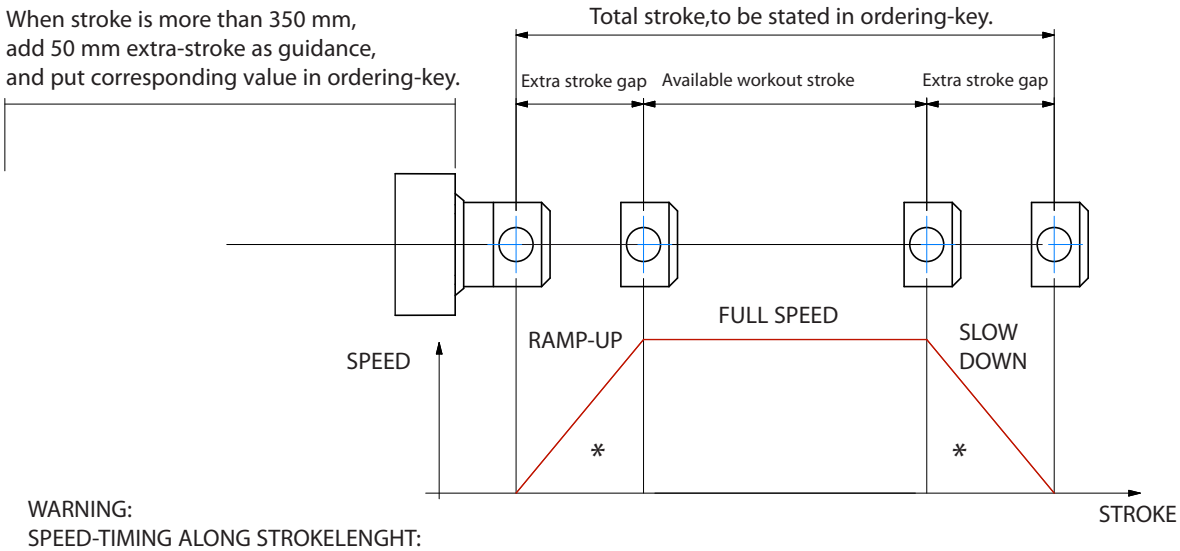
*With safety nut "G" = + 30 mm*
ALI3-F-VRS = + 40 mm ( safety nut unavailable)
*Bellows* + 20mm (*for FCM limitswitches contact our Officies*)

**REAR ENDS** | **MOTOR POSITION** | **E-BOX POSITION** | **LIMIT SWITCHES POSITION**



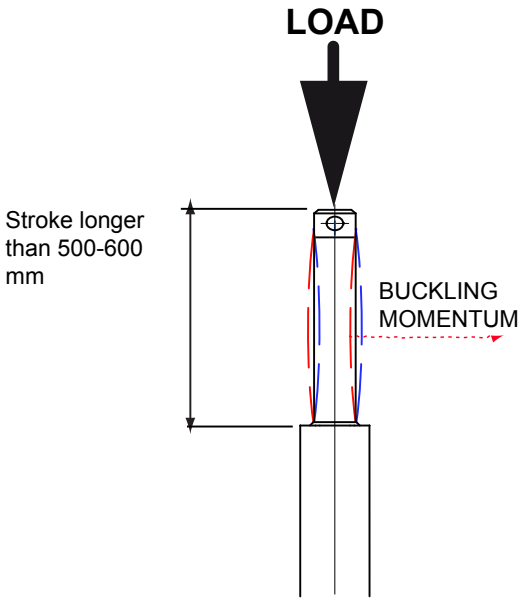
P1 Standard | P2 Rotated 90° | M0 | 1 Standard | M0 FC1

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important with high speed !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** With strokes longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see usermanuals.



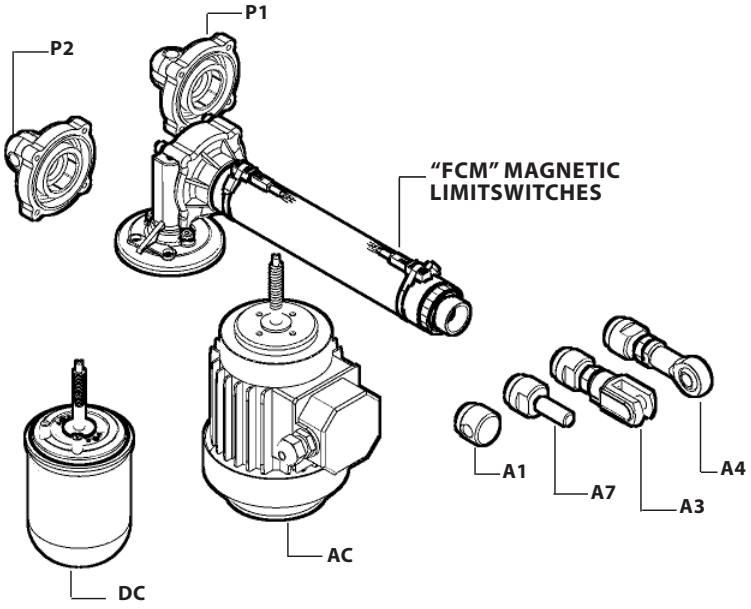

IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

**ALI3 / 0250 / M01 / CA-400/50-T-56-4-0,09 / AB / M1 / 1 / E01 / 2FC1 / P0T01A / FC1 / P1 / A1**

**MODEL:**
ALI3 / ALI3-F/ ALI3-VRS/ ALI3-F-VRS / ALI3-FCM
**STROKE:**
es. 250 mm = 0250
**VERSION:** (Pag. 29)
M01 / M02 / M03 / M04 / M05 (version D.C.)
M01 / M02 / M03 / M04 / M05 (version A.C.)
M00 = Not standard speed
**MOTOR:** (Pag. ACCESSORIES)
Advise only if with motor:
**A.C.**: version, voltage, type, size, n°pole, power
**D.C.**: version, voltage, size, Rpm
**AC MOTOR OPTIONS:** (Pag. ACCESSORIES)
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)
**MOTOR POSITION:**
**M0** None: Leave blank
**E-BOX POSITION:**
**1**
No Motor or DC Motor: Leave blank
**ENCODER:** (Pag. ACCESSORIES)
None: Leave blank
**LIMIT SWITCHES:** (Pag. ACCESSORIES)
None: Leave blank
**POTENTIOMETER:** (Pag. ACCESORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) None: Leave blank
**LIMIT SWITCHES POSITION:**
**FC1** None: Leave blank
**REAR END:**
**P1** = Eyelet (standard) **P2** = Eyelet (90°)
**FRONT END:**
**A1** = Eyelet (Std pag.30) **A4** = Rod end
**A3** = Yoke + Clip **A7** = M10 male

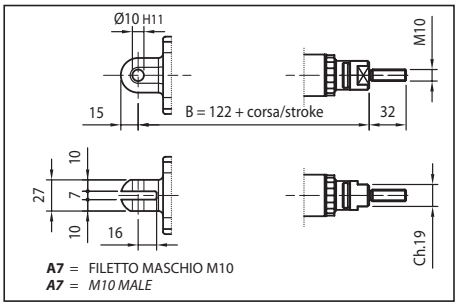
**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**



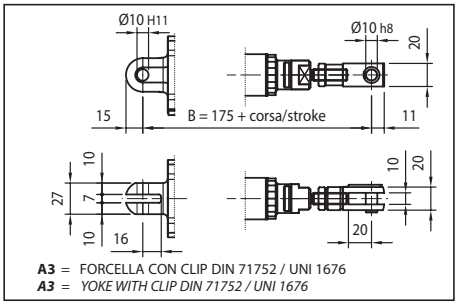

***Note:*** *"B" dimension changes according to model*

ALI3 = See pictures
ALI3 stroke > 320 mm = + 10 mm
ALI3-FCM = + 34 mm
ALI3-FCM stroke > 320 mm = +44
ALI3-F = + 23 mm
ALI3-F stroke > 320 mm = + 33 mm

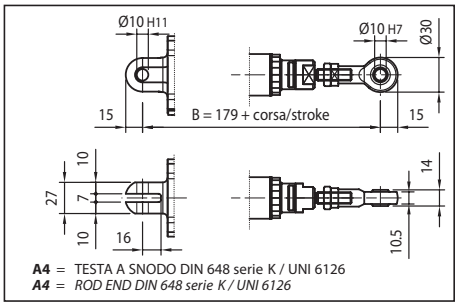
With safety nut "G" = + 30 mm
ALI3-VRS = + 40 mm
ALI3-F-VRS = + 63 mm
Bellows + 20mm




**A7** = FILETTO MASCHIO M10
***A7*** = *M10 MALE*




**A3** = FORCELLA CON CLIP DIN 71752 / UNI 1676
***A3*** = *YOKE WITH CLIP DIN 71752 / UNI 1676*

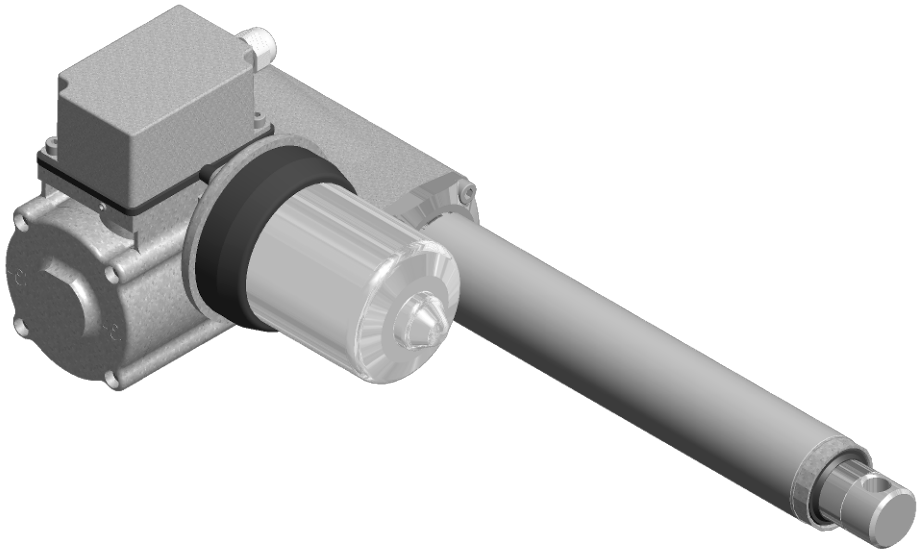



**A4** = TESTA A SNODO DIN 648 serie K / UNI 6126
***A4*** = *ROD END DIN 648 serie K / UNI 6126*

## ALI3-P Model CE

- Permanent magnet motor CE
- Worm gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Permanent grease lubrication
- IP65, tested according to rule CEI EN 60529
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a +30°C*
- Limit switches, potentiometer and encoder on request

(*) For any special duty please contact our technical dept.



| ALI3-P (Vdc) | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) | *Max Current for Fmax(A) 24Vdc* | ** |
| 3600 | 35 | M01 | 61.5 | - | 5000 | 14 | |
| 3600 | 25 | M02 | 61.5 | - | 5000 | 10 | |
| 6000 | 12 | M03 | 61.5 | - | 5000 | 11 | |
| 6000 | 9 | M04 | 61.5 | - | 5000 | 8,8 | |
| 6000 | 5 | M05 | 61.5 | - | 5000 | 7,2 | |

* With strokes longer than 350mm, check STROKE SETUP section.

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

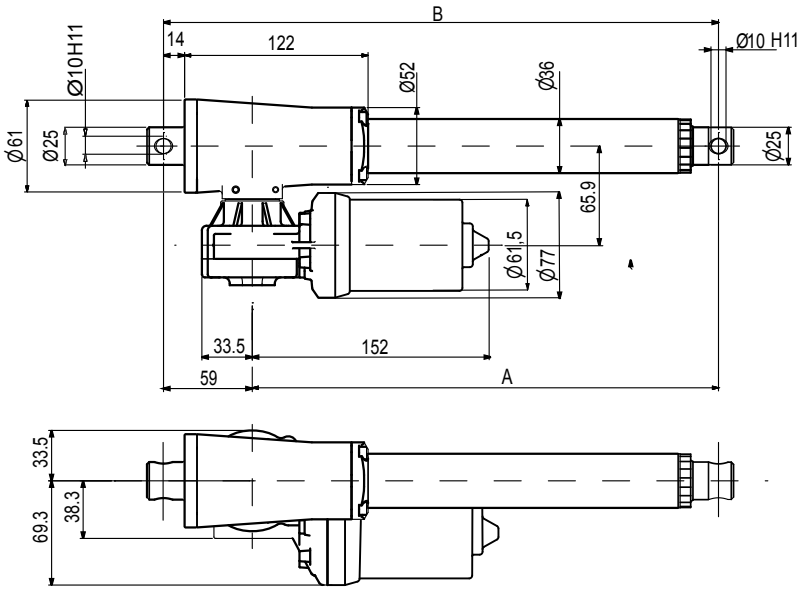
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

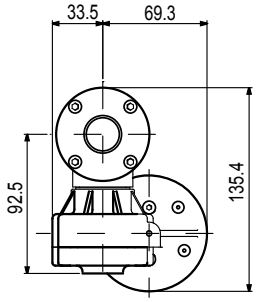
ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI3-P-F or ALI3-P-FCM) OR PUT THEM ON MACHINE/FRAME.

MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

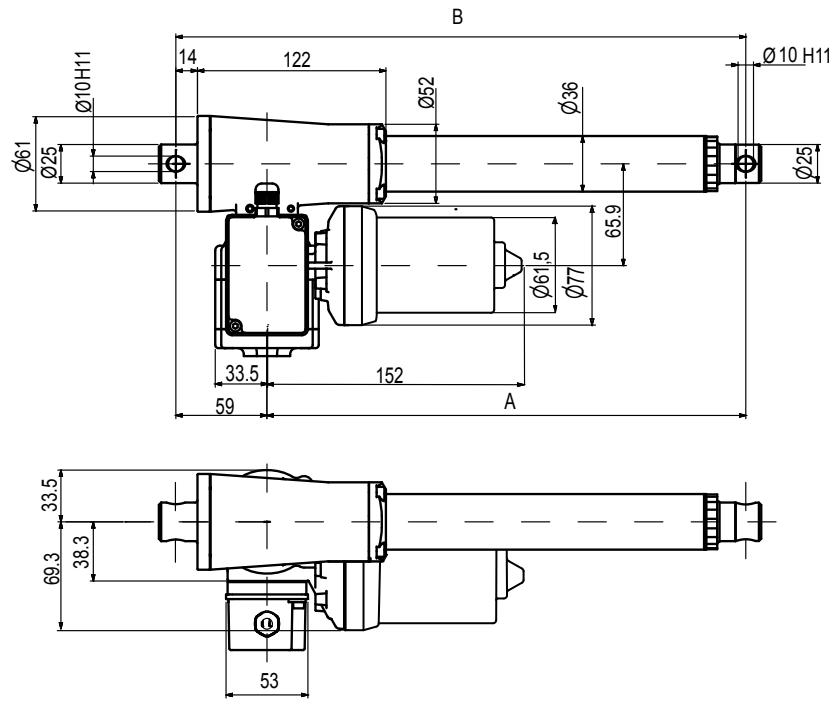
## ALI3-P *Version without limitswitches*

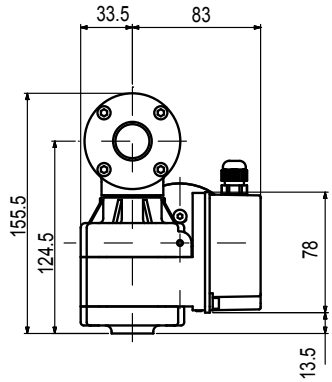



| DIMENSION | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|
| A | 110 + stroke | 121+ stroke |
| B | 169 + stroke | 180 + stroke |

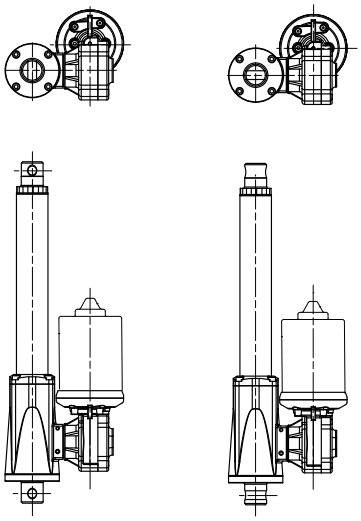
## ALI3-P-F *Version with limitswitches*




| DIMENSION | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|
| A | 110 + stroke | 121 + stroke |
| B | 169 + stroke | 180 + stroke |

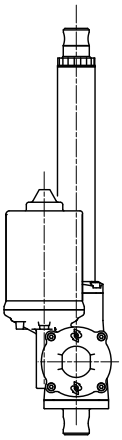
**REAR ENDS**



P1 Standard

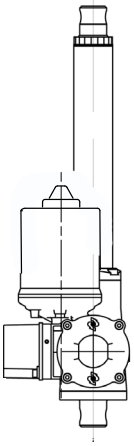
P2 Rotated 90°

**MOTOR POSITION**



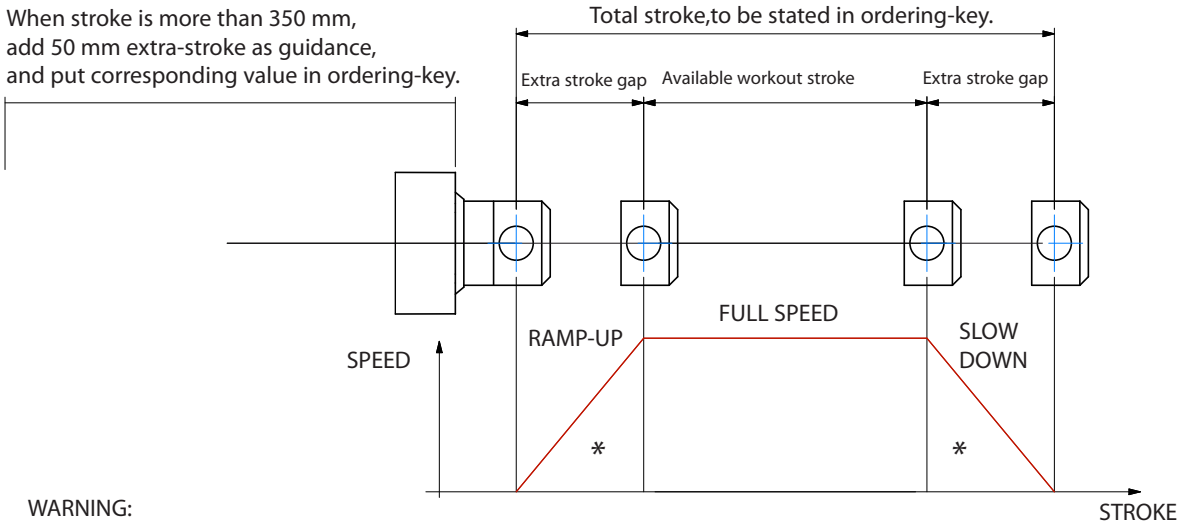
M0 (Standard)

**LIMIT SWITCHES POSITION**



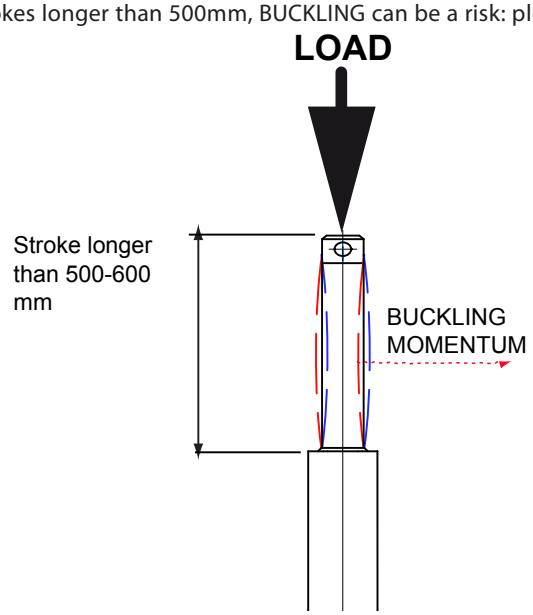
FC1 M0 (Standard)

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important with high speed!!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** With strokes longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see usermanuals.



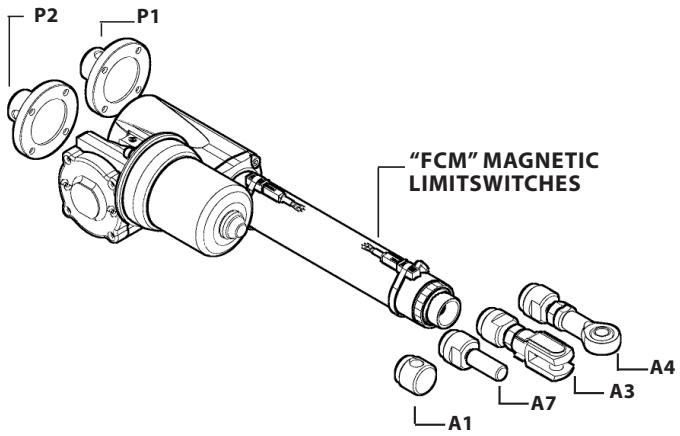

IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

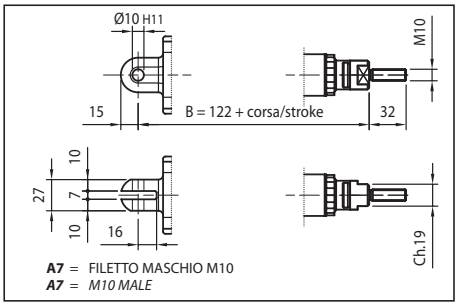
## ORDERING KEY

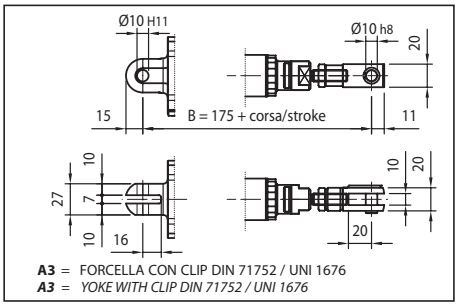
**ALI3-P-F / 0250 / M01 / CC-24-61,5-5000- / M1/ 1 / E01 / 2FC1 / P0T01A / FC1 / P1 / A1**

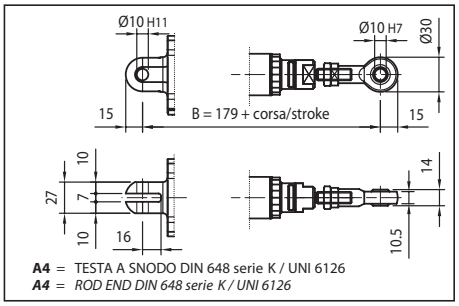
**MODEL:**
ALI3-P / ALI3-P-F
ALI3-P-FCM
**STROKE:**
es. 250 mm = 0250
**VERSION:** (pag.33)
M01 / M02 / M03 / M04 / M05/
(version D.C.)
M00 = Not standard speed
**MOTOR:** (Page ACCESSORIES)
**12** = 12 Vdc
**24** = 24 Vdc
**MOTOR POSITION:**
**M0** None: Leave blank
**E-BOX POSITION:**
**1**
No Motor or DC Motor: Leave blank
**ENCODER:** (Page ACCESSORIES)
None: Leave blank
**LIMIT SWITCHES:** (Page ACCESSORIES)
None: Leave blank
**POTENTIOMETER:**
**POT01A** (1Kohm) **POT10A** (10Kohm) *None: / Leave blank*
**LIMIT SWITCHES POSITION:**
**FC1** None: Leave blank
**REAR END:**
**P1** = Eyelet (standard) **P2** = Eyelet (90°)
**FRONT END:**
**A1** = Eyelet (Std pag.34) **A4** = Rod end
**A3** = Yoke + Clip **A7** = M10 male

**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**

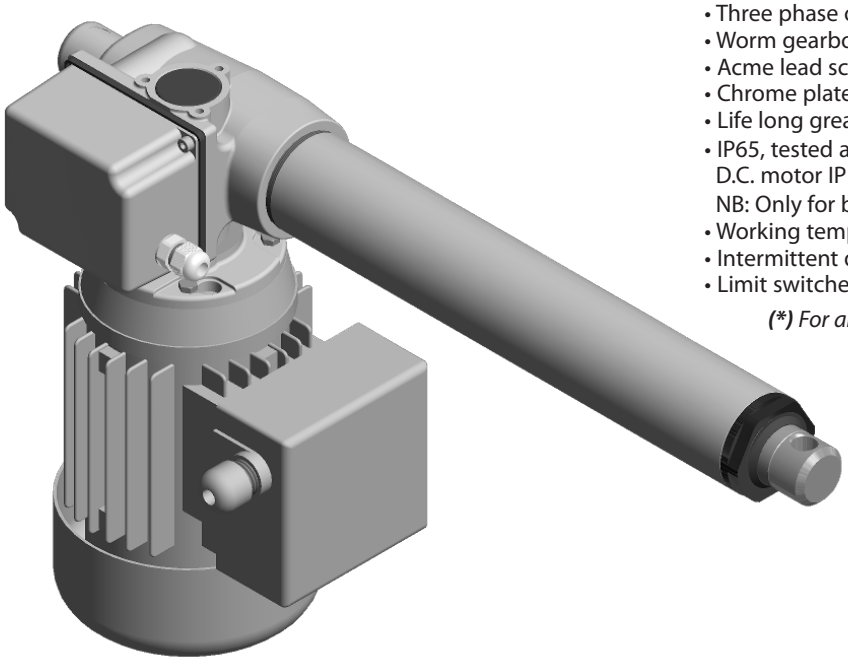



***Note:*** *"B" dimension changes according to model*
ALI3-P = see pictures
ALI3-P stroke > 320 mm = + 10 mm (for all versions)
ALI3-P-FCM = + 36 mm
with safety nut "G" = + 30 mm
Bellow + 20mm (no for versions FCM )



## ALI4-Model CE

- Permanent magnet motor CE
- Three phase or single phase motor CE
- Worm gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Life long grease lubricated
- IP65, tested according to rule CEI EN 60529
  D.C. motor IP 54 standard - IP65 on request
  NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a +30°C*
- Limit switches, potentiometer and encoder on request

***(*)*** *For any special duty please contact our technical dept.*

**ALI4 (Vac 3-phase)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 2100 | 93 | M01 | IEC71 | 0,55 | 2800 |
| * | 3900 | 47 | M02 | IEC71 | 0,55 | 2800 |
| | 5300 | 23 | M03 | IEC63 | 0,37 | 1400 |
| | 8600 | 9 | M04 | IEC63 | 0,22 | 1400 |
| | 9400 | 6 | M05 | IEC63 | 0,18 | 1400 |
| | 10000 | 3 | M06 | IEC63 | 0,13 | 1400 |
| | 10000 | 2 | M07 | IEC56 | 0,09 | 1400 |

**ALI4 (Vdc)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) | Max Current for F max(A) 24Vdc | |
|---|---|---|---|---|---|---|---|---|
| * | 600 | 100 | M20 | D.85 | - | 3000 | 10 | ** |
| * | 1100 | 50 | M21 | D.85 | - | 3000 | 13 | |
| | 2800 | 20 | M22 | D.85 | - | 3000 | 13,5 | |
| | 4100 | 13 | M23 | D.85 | - | 3000 | 14 | |
| | 6800 | 7 | M24 | D.85 | - | 3000 | 12 | |
| | 10000 | 4 | M25 | D.85 | - | 3000 | 13 | |

**ALI4-VRS (ballscrew 16x5) (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 2500 | 58 | M08 | IEC63 | 0,25 | 2800 |
| | 3100 | 29 | M09 | IEC63 | 0,18 | 1400 |
| | 3400 | 23 | M10 | IEC56 | 0,14 | 2800 |
| | 5000 | 15 | M11 | IEC56 | 0,14 | 2800 |
| | 6000 | 7 | M12 | IEC56 | 0,09 | 1400 |
| | 7500 | 4 | M13 | IEC56 | 0,09 | 1400 |

**ALI4 - VRS (ballscrew 16x5) 24 Vdc**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) | Max Current for F max(A) 24Vdc | |
|---|---|---|---|---|---|---|---|---|
| * | 2400 | 63 | M26 | D.85 | - | 3000 | 14 | ** |
| | 3400 | 25 | M27 | D.85 | - | 3000 | 12 | |
| | 3900 | 16 | M28 | D.85 | - | 3000 | 10 | |
| | 6800 | 8 | M29 | D.85 | - | 3000 | 9 | |
| | 7500 | 5 | M30 | D.85 | - | 3000 | 9 | |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

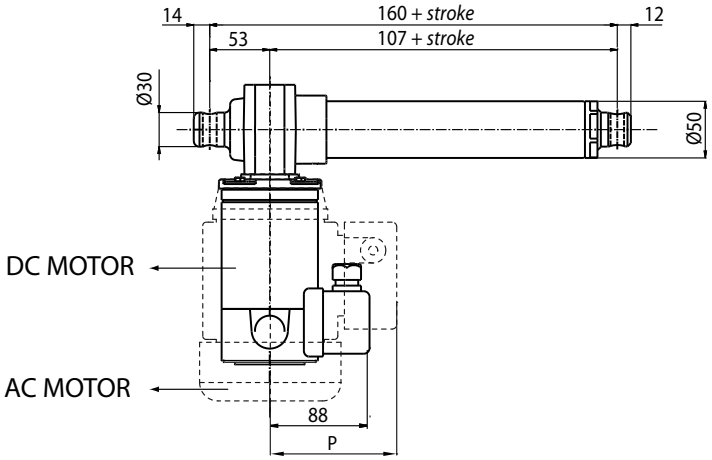
BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

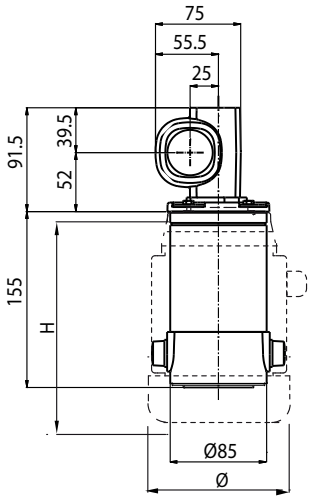
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

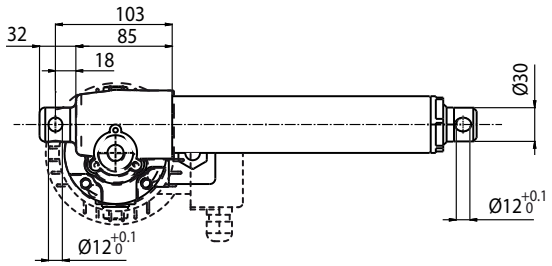
ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO AVOID **FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI4-F or ALI4-FCM) OR PUT THEM ON MACHINE/FRAME.

## ALI4 *Version without limitswitches*



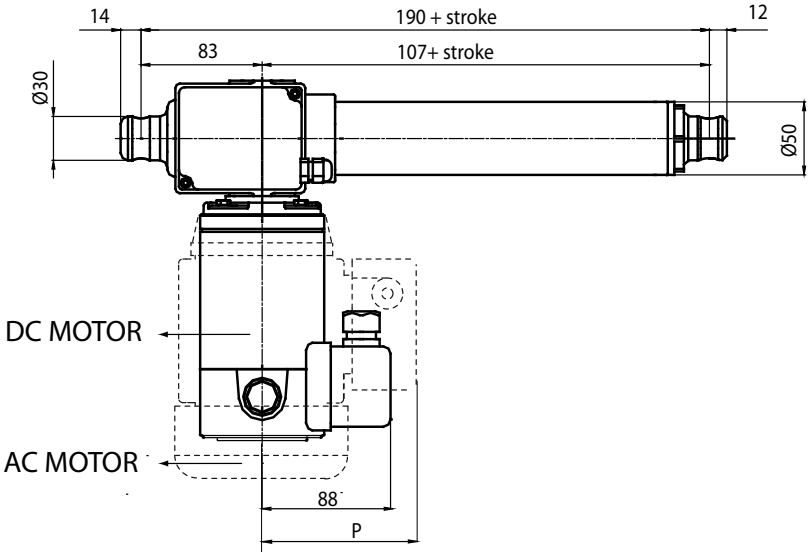



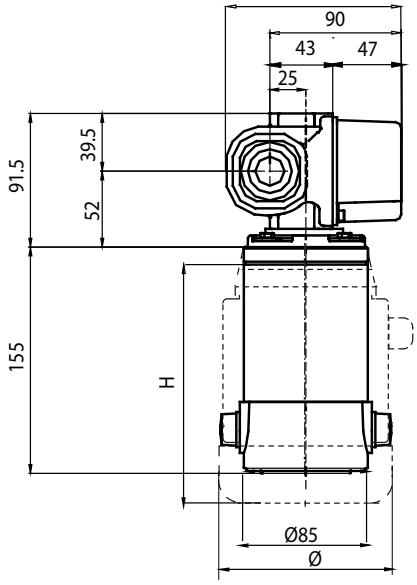



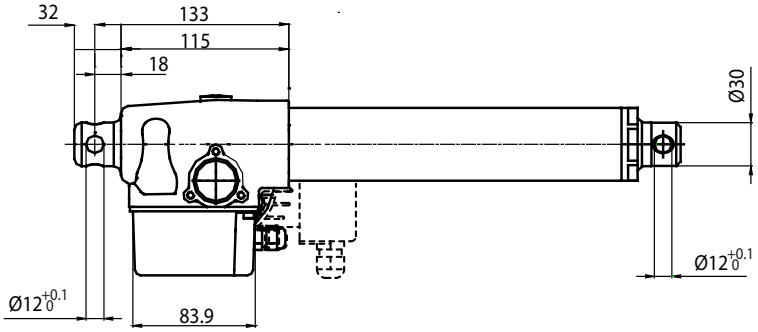

| A.C. MOTORS DIMENSIONS | | | | |
|---|---|---|---|---|
| GR. / *SIZE* | *TYPE* | H | Ø | P |
| 56 | Standard | 168 | 116 | 108 |
| | *Brake motors* | 200 | | |
| 63 | Standard | 190 | 129 | 110 |
| | *Brake motors* | 235 | | |
| 71 | Standard | 220 | 146 | 121 |
| | *Brake motors* | 267 | | |

*With safety nut "G" = + 30 mm*
ALI4-VRS = + 25 mm ( safety nut unavailable)
*Bellows* + 20mm (*for FCM limitswitches contact our Officies*)

## ALI4-F *Version with limitswitches*



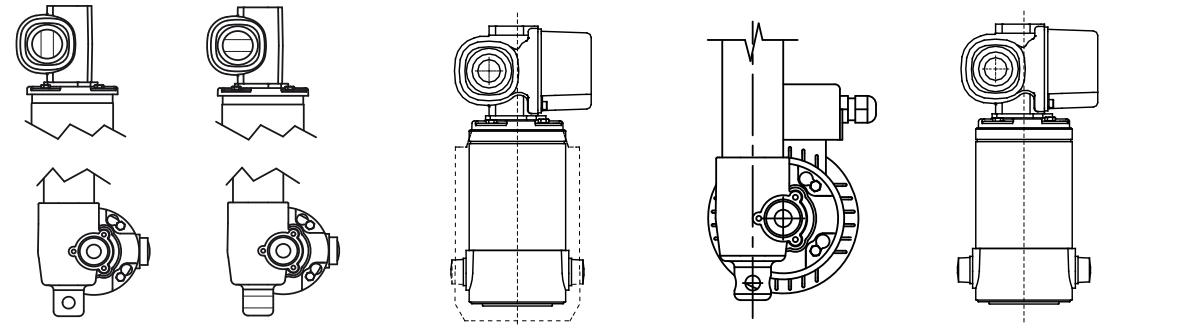




| A.C. MOTORS DIMENSIONS | | | | |
|---|---|---|---|---|
| *SIZE* | *TYPE* | H | Ø | P |
| 56 | Standard | 168 | 116 | 108 |
| | *Brake motors* | 200 | | |
| 63 | Standard | 190 | 129 | 110 |
| | *Brake motors* | 235 | | |
| 71 | Standard | 220 | 146 | 121 |
| | *Brake motors* | 267 | | |

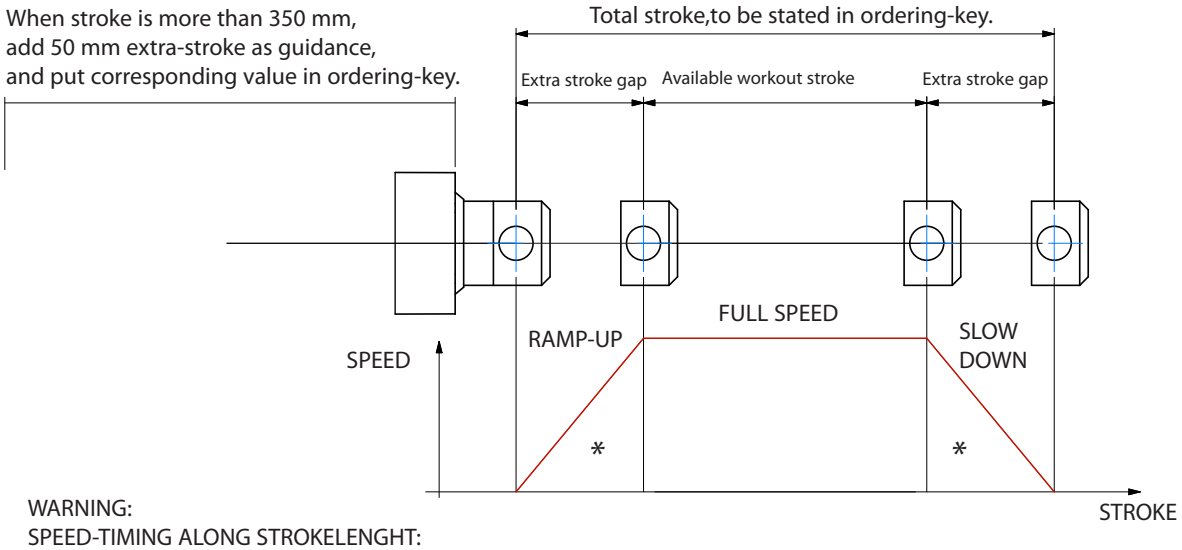
*With safety nut "G" = + 30 mm*
ALI4-VRS = + 25 mm ( safety nut unavailable)
*Bellows* + 20mm (*for FCM limitswitches contact our Officies*)

**REAR ENDS** | **MOTOR POSITION** | **E-BOX POSITION** | **LIMIT SWITCHES POSITION**



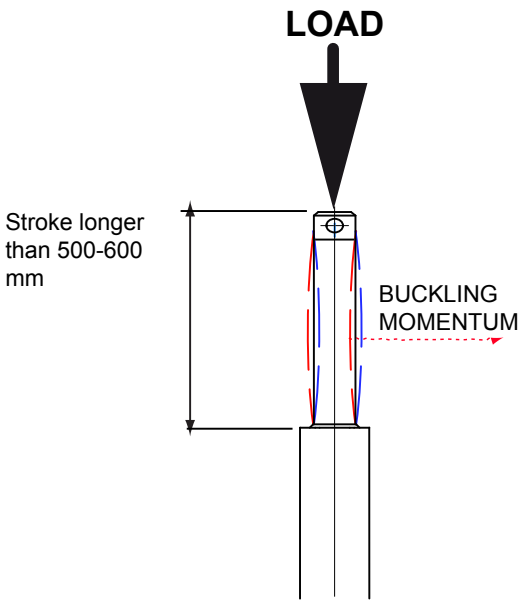
P1 Standard | P2 Rotated 90° | M0 ( Standard) | 1 Standard | FC1 (Standard) M0

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is > 40mm/s !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** Whit strokes longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see usermanuals.




IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

**ALI4 / 0250 / M01 / CA-400/50-T-56-4-0,09 / AB / FC1 /M0 / 1 / E01 / 2FC2 / P0T01A / P1 / A1**

**MODEL:**
ALI4 / ALI4-F / ALI4-FCM / ALI4-FCI
ALI4-VRS / ALI4-VRS-F / ALI4-VRS-FCM
ALI4-VRS-FCI

**STROKE:**
es. 250 mm = 0250

**VERSION:** (Pag. 37)
Advise: choose among
M00 Not standard speed
Flanged Version = Rpm
Advise reduction ratio and screw pitch

**MOTOR:**
Advise only if with motor:
**A.C.**: version, voltage, type, size, n°pole, power
**D.C.**: version, voltage, size, Rpm
With motorflange only put 0
With special motorflange put: PD

**AC MOTOR OPTIONS:** (Pag.ACCESSORIES)
Motorflange: for motorflange version only advise size - i.e.for IEC56 B14 put 56B14
No motor or DC motor: leave all following parameters blank
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)

**LIMIT SWITCHES POSITION:**
**FC1** None: Leave blank

**MOTOR POSITION:**
**M0** None: Leave blank

**E-BOX POSITION:**
**1** No Motor: Leave blank

**ENCODER:** (Pag. ACCESSORIES)
None: Leave blank

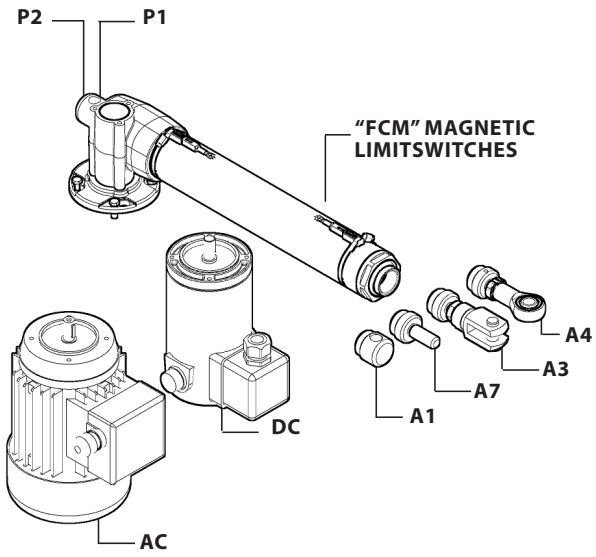
**LIMIT SWITCHES:** (Pag. ACCESSORIES)
None: Leave blank

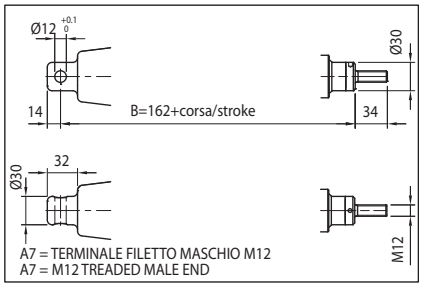
**POTENTIOMETER:** (Pag. ACCESSORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) *None: Leave blank*

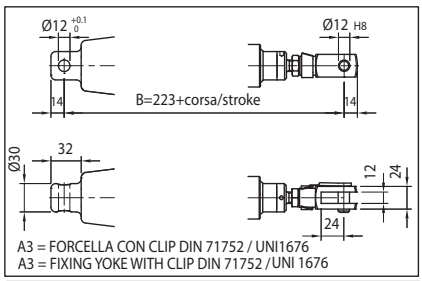
**REAR END:**
**P1** = Eyelet (standard) **P2** = Eyelet (90°)

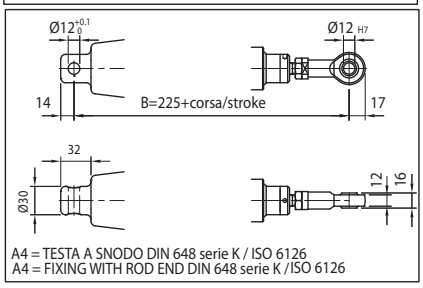
**FRONT END:**
**A1** = Eyelet (Std pag.38) **A3** = Yoke + Clip
**A4** = Rod end **A7** = M12 male

**NOTE:** COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION.



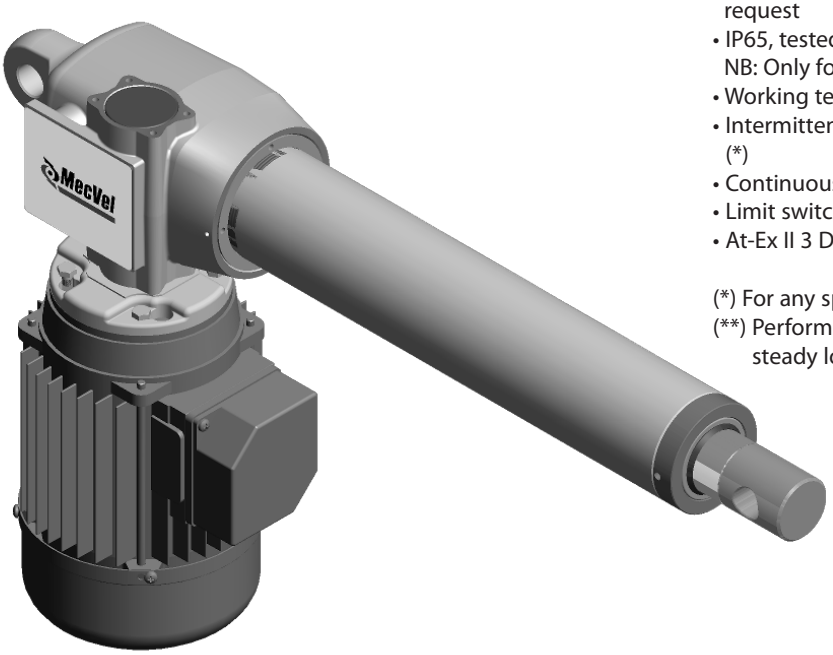




***Note:*** *"B" dimension variations depending on model*
ALI4 = see pictures ALI4-F = + 30 mm ALI4-FCM = + 42,5 mm ALI4-FCI = + 42,5 mm
with safety nut "G" = + 30 mm (i.e. ALI4-F "G" option = +30)
ALI4-VRS (versione 16x5) = + 25 mm ALI4-VRS-F (versione 16x5) = + 55 mm
ALI4-VRS-FCM (versione 16x5) = + 53 mm ALI4-VRS-FCI (versione 16x5) = + 53 mm
L = + 15 mm
Bellows = + 15 mm (excluding FCM and FCI version, for versions FCM and FCI contact MecVel)

## ALI5-Model CE

- Three phase or single phase motor CE
- Worm gearbox (ALI5)
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push road
- Grease (standard) or oil (VRS continuous duty S1) lubricated on request
- IP65, tested according to rule CEI EN 60529
  NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5min) a +30°C acme lead screw version (*)
- Continuous duty S1 +30°C ballscrew version on request (**)
- Limit switch, potentiometer, encoder on request
- At-Ex II 3 D T4 version (A.C.motor) on request

(*) For any special duty, please contact our technical department
(**) Performance are related to ball screw, lifetime of 2000 hours with steady load and without shocks or vibrations




**ALI 5 VRS (Vac 3-phase ballscrew)**

| | *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) |
|---|---|---|---|---|---|---|
| * | 4800 | 93 | M45 | IEC71 | 0.55 | 2800 |
| * | 6000 | 47 | M46 | IEC71 | 0.37 | 2800 |
| | 7500 | 23 | M47 | IEC71 | 0.37 | 2800 |
| | 9500 | 12 | M48 | IEC71 | 0.25 | 1400 |
| | 12000 | 6 | M49 | IEC71 | 0.25 | 1400 |

**ALI5 (Vac 3-phase Acme lead screw)**

| | *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) |
|---|---|---|---|---|---|---|
| * | 4300 | 93 | M01 | IEC80 | 1,1 | 2800 |
| * | 7200 | 47 | M02 | IEC80 | 1,1 | 2800 |
| | 11000 | 23 | M03 | IEC71 | 0,75 | 2800 |
| | 18000 | 12 | M04 | IEC71 | 0,37 | 2800 |
| | 18000 | 6 | M05 | IEC71 | 0,37 | 1400 |
| | 18000 | 3 | M06 | IEC71 | 0,37 | 1400 |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

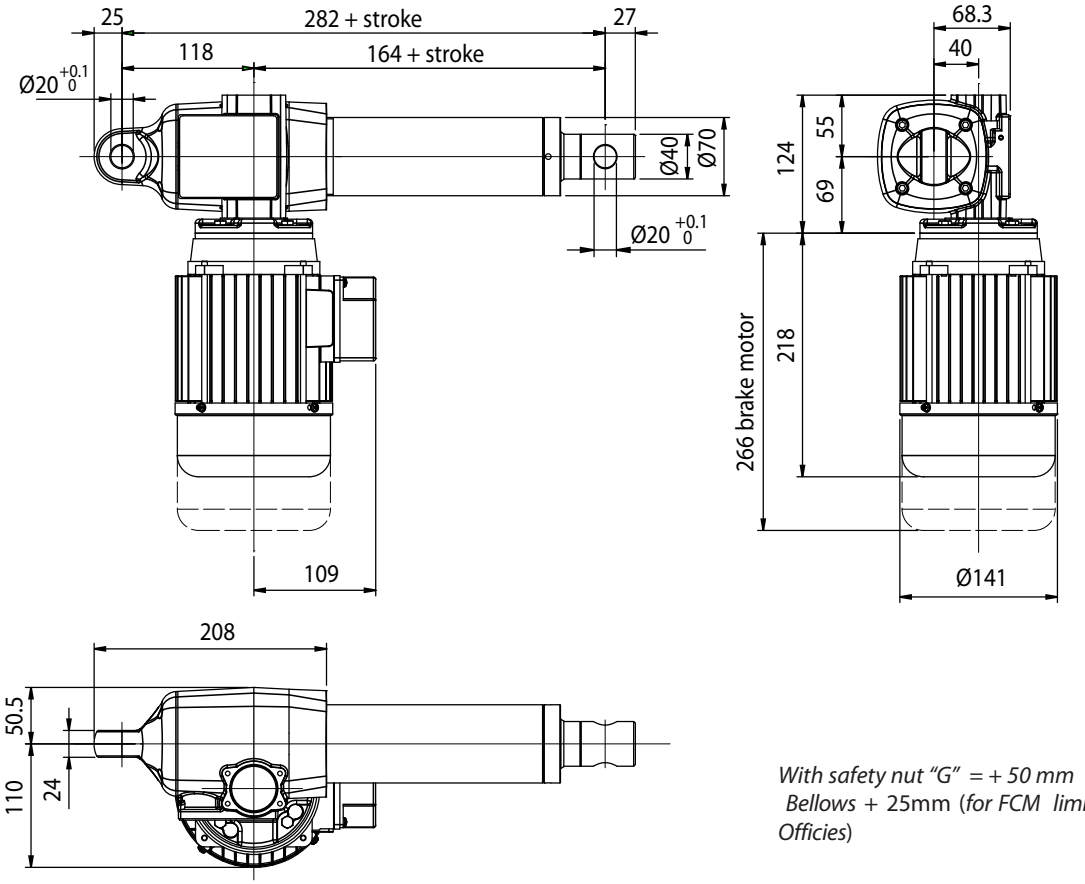
BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

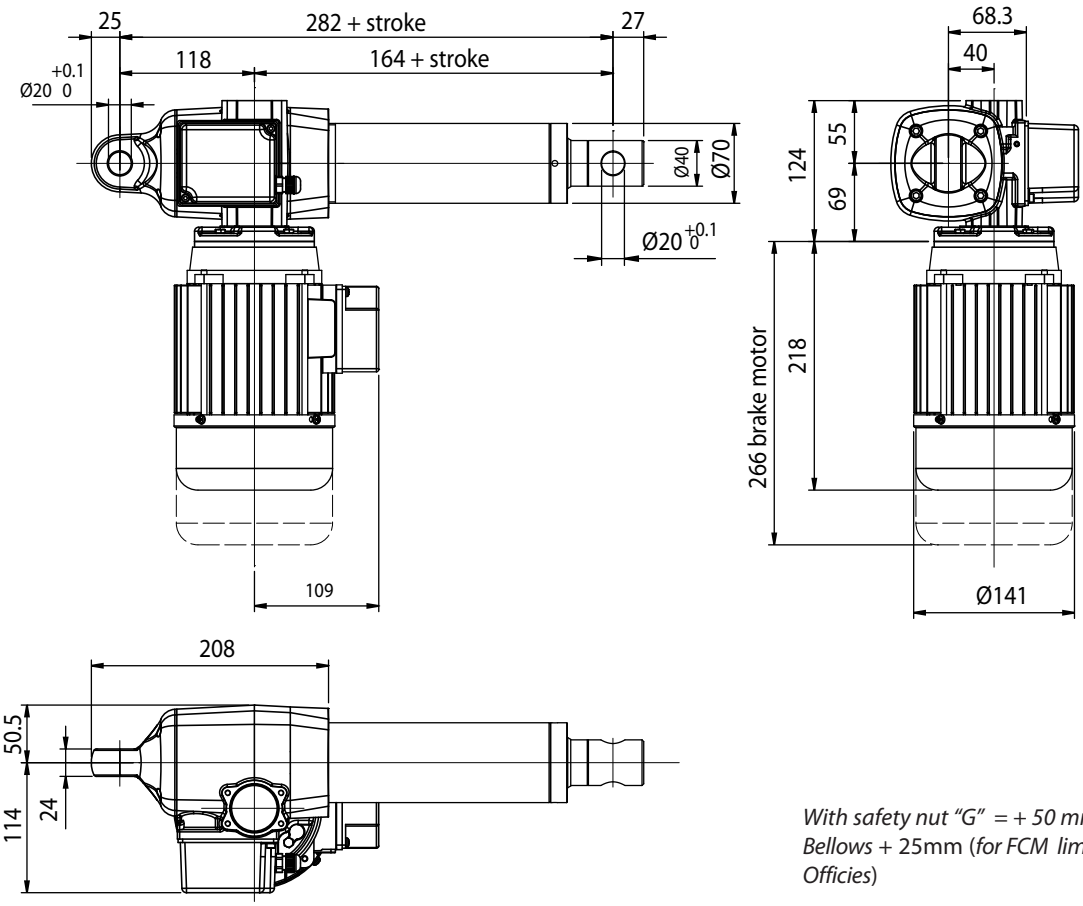
CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI5-F or ALI5-FCM) OR PUT THEM ON MACHINE/FRAME.

## ALI5 *Version without limitswitches*



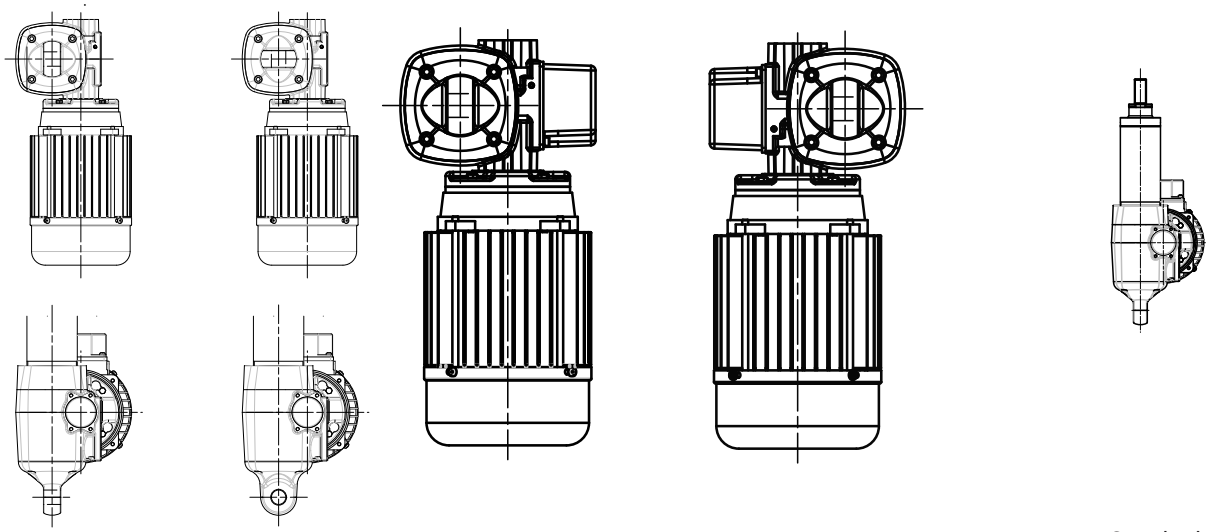

*With safety nut "G" = + 50 mm*
*Bellows* + 25mm (*for FCM limitswitches contact our Offices*)

## ALI5-F *Version with limitswitches*



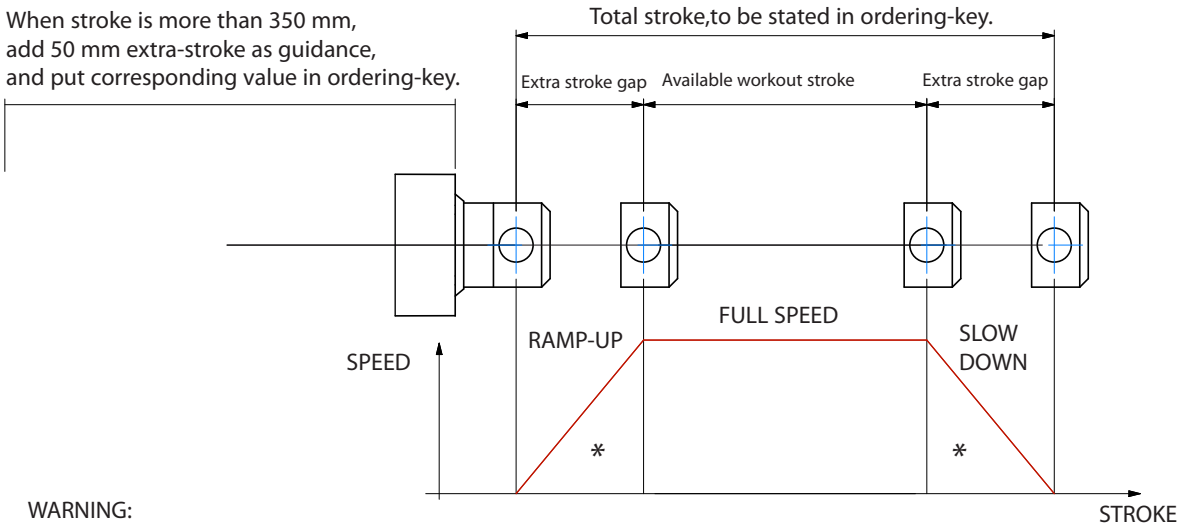

*With safety nut "G" = + 50 mm*
*Bellows* + 25mm (*for FCM limitswitches contact our Offices*)

**REAR ENDS** | **MOTOR POSITION** | **LIMIT SWITCHES POSITION** | **E-BOX POSITION**



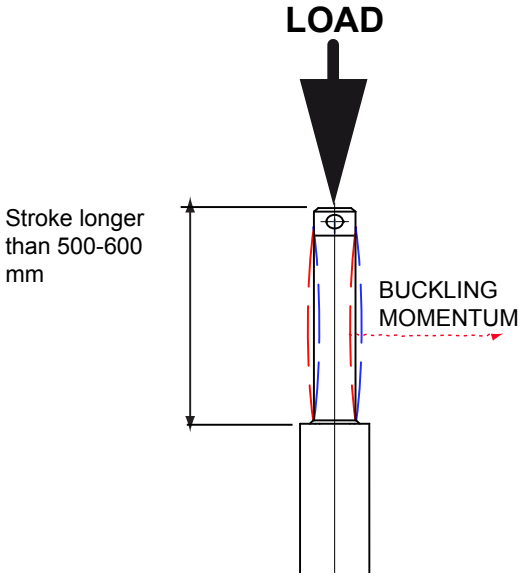
P1 Standard | P2 Rotated 90° | M0-FC1 | M1-FC2 | 1 Standard

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is > 40mm/s !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.




IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

**ALI5 / 0300 / M01 / CA-400-50-T-71-2-0,55 / AB / M0-FC1 / 1 / E05 / 2FC2/ P0T01A / P1 / A1**

**MODEL:**
ALI5 / ALI5-F / ALI5-FCM / ALI5-FCI
ALI5-VRS / ALI5-F-VRS
ALI5–VRS-FCM / ALI5-VRS-FCI

**STROKE:**
es. 300 mm = 0300

**VERSION:** (pag.41)
Advise: choose among
Flanged Version = Rpm
Advise reduction ratio and screw pitch (ALI5)

**MOTOR:** (pag. ACCESSORIES)
Advise only if with motor:
version, voltage, type, size, n°pole, power
With motorflange only put 0
With special motorflange put: PD

**AC MOTOR OPTIONS:**
(pag. ACCESSORIES)
Motorflange: for motorflange version only advise size - i.e.for IEC71 B14 put 71B14
No motor: leave all following parameters blank
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)

**MOTOR LIMIT SWITCHES POSITION:**
**M0-FC1 / M1-FC2** None: Leave blank

**E-BOX POSITION:**
**1** No Motor: Leave blank

**ENCODER:** (pag. ACCESSORIES)
None: Leave blank

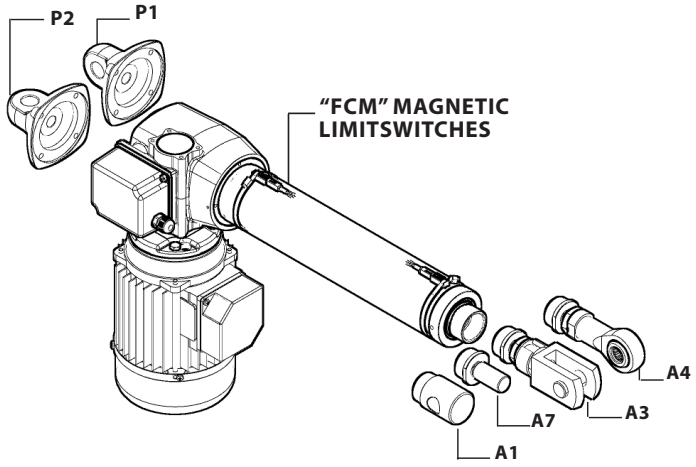
**LIMIT SWITCHES:** (pag. ACCESSORIES)
None: Leave blank

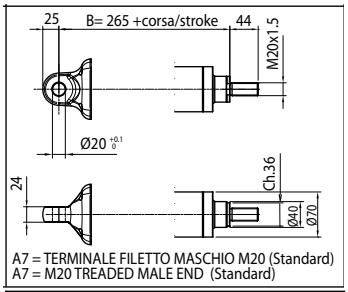
**POTENTIOMETER:** (pag. ACCESSORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) None: Leave blank

**REAR END:**
**P1** = Eyelet **P2** = Eyelet (90°)

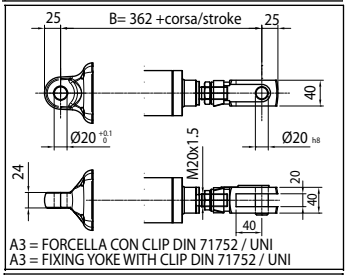
**FRONT END:**
**A1** = Eyelet (Std pag. 42 ) **A3** = Yoke + Clip
**A4** = Rod end **A7** = M20x1,5 male

**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**

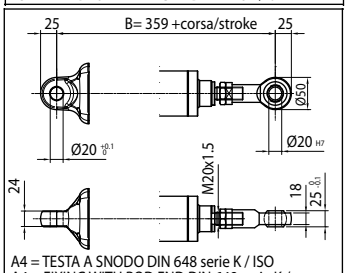


A7 = TERMINALE FILETTO MASCHIO M20 (Standard)
A7 = M20 TREADED MALE END (Standard)



A3 = FORCELLA CON CLIP DIN 71752 / UNI
A3 = FIXING YOKE WITH CLIP DIN 71752 / UNI

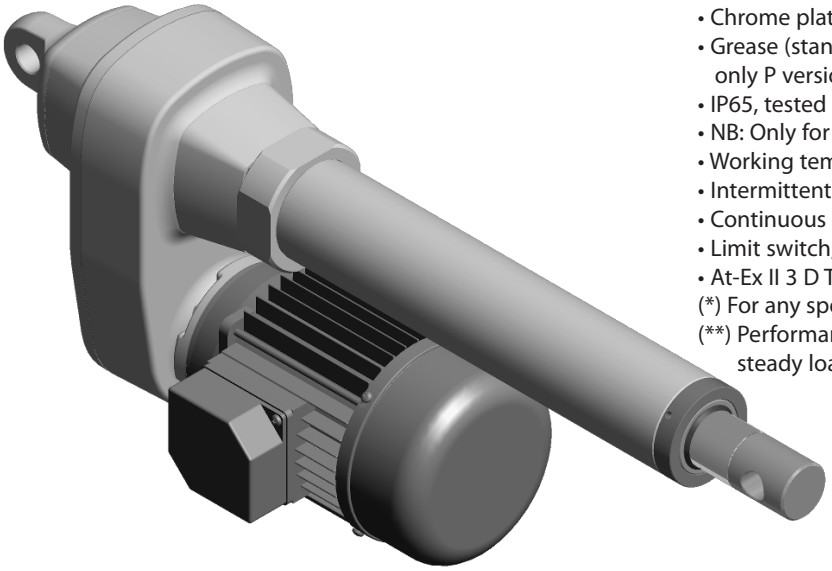


A4 = TESTA A SNODO DIN 648 serie K / ISO
A4 = FIXING WITH ROD END DIN 648 serie K /

***Note:*** *"B" dimension variations depending on model*

| | |
|---|---|
| ALI5 / ALI5-F = See pictures | ALI5 / ALI5-F stroke > 500 = + 20 mm |
| ALI5-FCM stroke < 500 = + 40 mm | ALI5-FCM stroke > 500 = + 60 mm |
| ALI5-FCI stroke < 500 = + 30 mm | ALI5-FCI stroke > 500 = + 50 mm |
| ALI5-VRS ALI5-F-VRS stroke < 500 = + 88 mm | ALI5-VRS ALI5-F-VRS stroke > 500 = +108 mm |
| ALI5-VRS-FCM corsa stroke < 500 = + 128 mm | ALI5-VRS-FCM stroke > 500 = + 148 mm |
| ALI5-VRS-FCI stroke < 500 = + 118 mm | ALI5-VRS-FCI stroke > 500 = + 138 mm |

with safety nut "G"= + 50 mm (Es. ALI5-F opzione "G" = +50) / (i.e. ALI5-F "G" option = +50)
antirotation device "L" = + 15 mm
Bellows = + 25 (excluding FCM and FCI version, for version FCM and FCI contact MecVel)



## ALI5-P Cross gears
## ALI5-PB Belt drive

CE

- Three phase or single phase motor CE
- Cross gears (ALI5-P)
- Belt drive (ALI5-PB)
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push road
- Grease (standard) or oil (VRS continuous duty S1) lubricated only P version
- IP65, tested according to rule CEI EN 60529
- NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5min) a +30°C acme lead screw version (*)
- Continuous duty S1 +30°C ballscrew version (**)
- Limit switch, potentiometer, encoder on request
- At-Ex II 3 D T4 version (A.C.motor) on request

(*) For any special duty, please contact our technical department

(**) Performance are related to ball screw, lifetime of 2000 hours with steady load and without shocks or vibrations

| | ALI5P - AC - *ACME LEAD SCREW - S3 30% (5 min) 30°C* | | | | | |
|---|---|---|---|---|---|---|
| | ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** |
| * | 2700 | 113 | M11 | IEC71 | 0.55 | 2800 |
| * | 4000 | 57 | M12 | IEC71 | 0.37 | 1400 |
| | 6600 | 28 | M13 | IEC71 | 0.37 | 1400 |
| | 15000 | 14 | M14 | IEC71 | 0.37 | 1400 |
| | 15000 | 9 | M15 | IEC71 | 0.37 | 1400 |
| | 15000 | 5 | M16 | IEC71 | 0.25 | 1400 |

| | ALI5P - AC - *BALLSCREW - S1* | | | | | |
|---|---|---|---|---|---|---|
| | ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** |
| * | 3900 | 113 | M56 | IEC71 | 0.55 | 2800 |
| * | 5500 | 57 | M57 | IEC71 | 0.37 | 1400 |
| | 7000 | 28 | M58 | IEC71 | 0.37 | 1400 |
| | 9000 | 14 | M59 | IEC71 | 0.25 | 1400 |
| | 10000 | 9 | M60 | IEC71 | 0.25 | 1400 |

| | ALI5PB - AC - *ACME LEAD SCREW - S3 30% (5 min) 30°C* | | | | | |
|---|---|---|---|---|---|---|
| | ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** |
| * | 2800 | 233 | M17 | IEC80 | 1.10 | 2800 |
| * | 3300 | 194 | M18 | IEC80 | 1.10 | 2800 |
| * | 4600 | 117 | M19 | IEC80 | 1.10 | 2800 |
| * | 5500 | 97 | M20 | IEC80 | 1.10 | 2800 |
| * | 6900 | 58 | M21 | IEC80 | 0.75 | 1400 |
| * | 8300 | 49 | M22 | IEC80 | 0.75 | 1400 |

| | ALI5PB - AC - VRS - *BALLSCREW - S1* | | | | | |
|---|---|---|---|---|---|---|
| | ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** |
| * | 3600 | 223 | M61 | IEC80 | 1.10 | 2800 |
| * | 3800 | 194 | M62 | IEC80 | 1.10 | 2800 |
| * | 4300 | 117 | M63 | IEC80 | 0.75 | 1400 |
| * | 4500 | 97 | M64 | IEC80 | 0.55 | 1400 |
| * | 4500 | 49 | M65 | IEC71 | 0.25 | 1400 |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

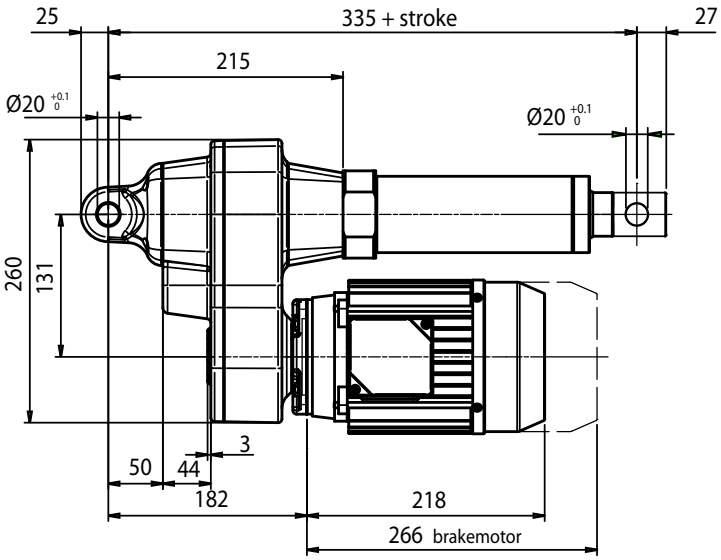
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

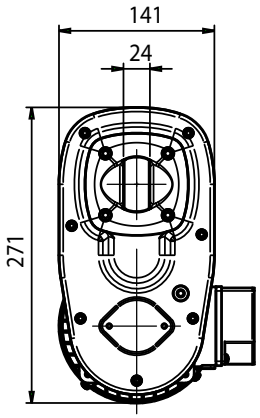
ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

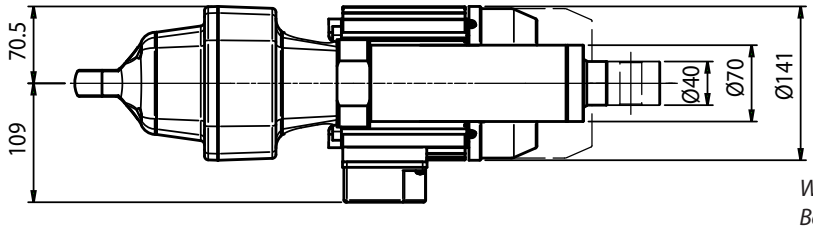
CONSIDER MECVEL's LIMITSWITCHES ( MODEL ALI5-P-F or ALI5-PB-F) OR PUT THEM ON MACHINE/FRAME.

MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

## ALI5-P-PB *Version without limitswitches*

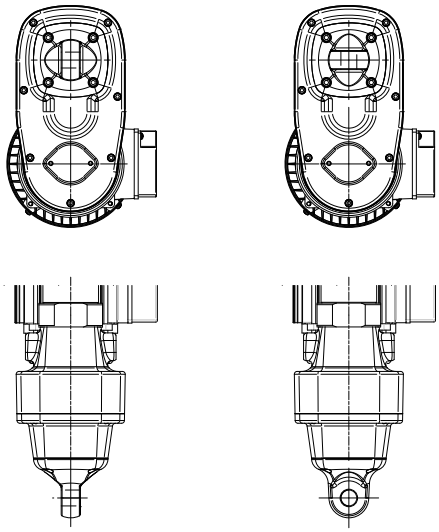


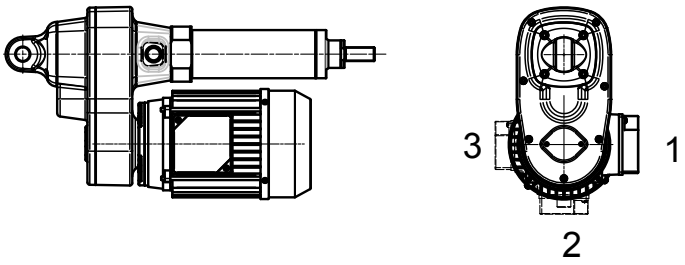

*With safety nut "G" = + 50 mm*
*Bellows* + 25mm (*for FCM limitswitches contact our Officies*)

**REAR ENDS**

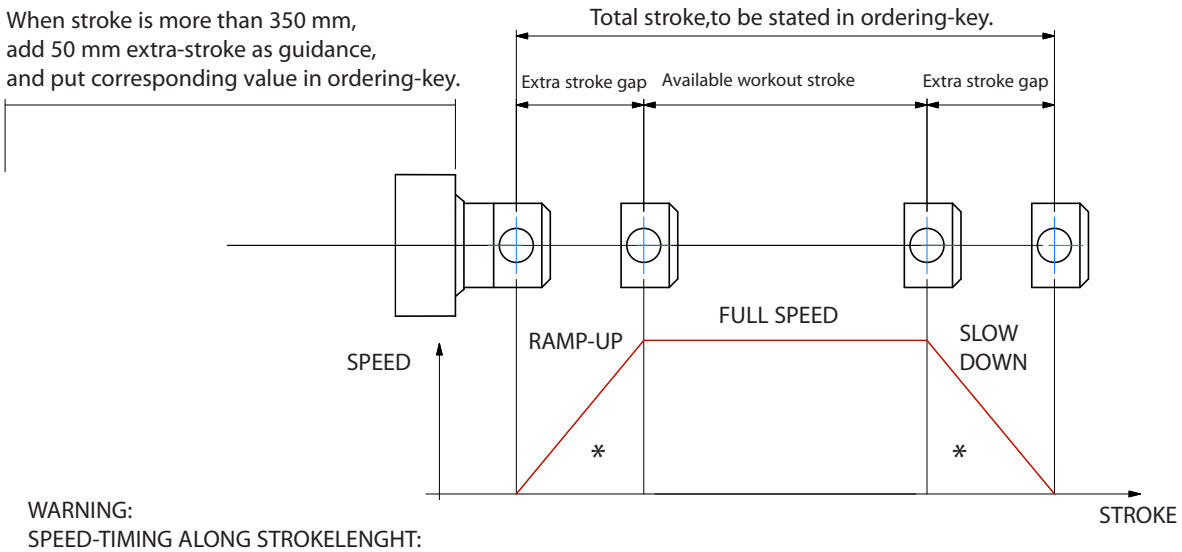


P1 Standard P2 Ruotato 90°

**E-BOX POSITION**

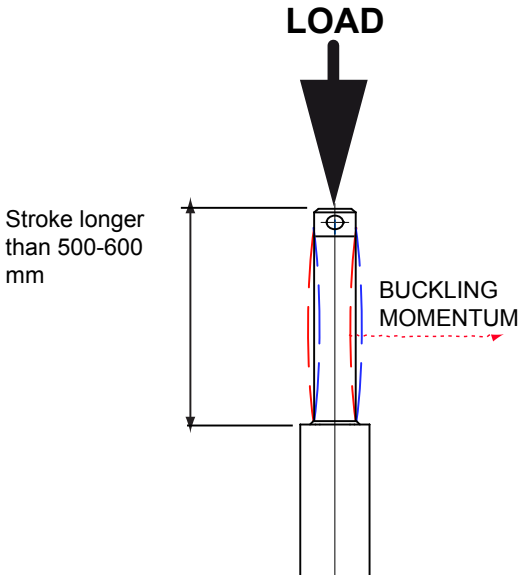



***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is > 40mm/s !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.




IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

**ALI5-P / 0300 / M01 / CA-400-50-T-71-2-0,55 / B5 + AB / 1 / E05 / 2FCM0 / P0T01A / P1 / A1**

**MODEL:**
ALI5-P / ALI5-PB / ALI5-P-FCM / ALI5-P-FCI
ALI5-P-VRS / ALI5-P-VRS
ALI5–P-VRS-FCM / ALI5-P-VRS-FCI

**STROKE:**
es. 300 mm = 0300

**VERSION:** (pag.45)
Advise: choose among
Flanged Version = Rpm
Advise reduction ratio and screw pitch (ALI5)

**MOTOR:** (pag. ACCESSORIES)
Advise only if with motor:
version, voltage, type, size, n°pole, power
With motorflange only put 0
With special motorflange put: PD

**AC MOTOR OPTIONS:** (pag. ACCESSORIES)
Motorflange: for motorflange version only advise size - i.e.for IEC71 B14 put 71B14
No motor: leave all following parameters blank
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)

**E-BOX POSITION:**
**1** No Motor: Leave blank

**ENCODER:** (pag. ACCESSORIES)
None: Leave blank

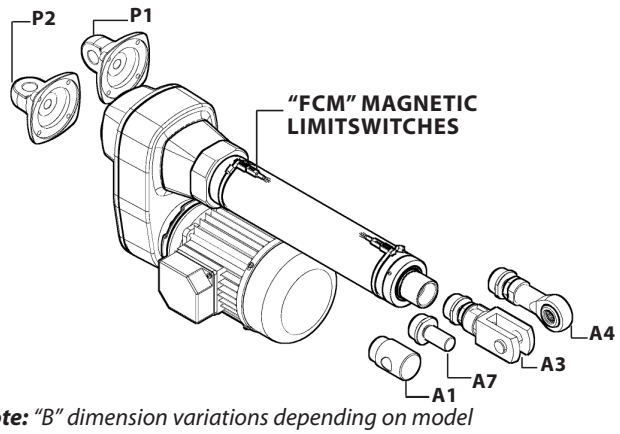
**LIMIT SWITCHES:** (psg. ACCESSORIES)
None: Leave blank

**POTENTIOMETER:** (psg. ACCESSORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) *None: / Leave blank*

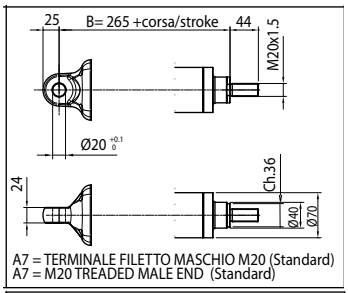
**REAR END:**
**P1** = *Eyelet* **P2** = *Eyelet* (90°)

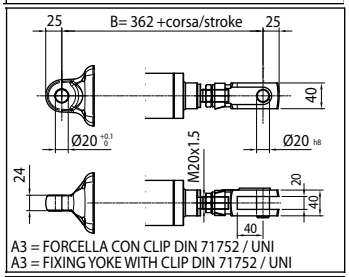
**FRONT END:**
**A1** = Eyelet (Std pag. 46) **A3** = Yoke + Clip
**A4** = Rod end **A7** = M20x1,5 male

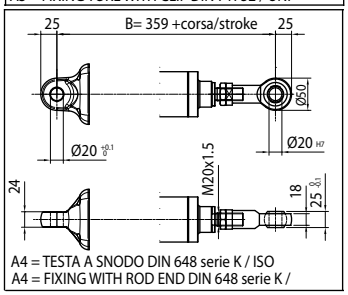
**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**




***Note:*** *"B" dimension variations depending on model*



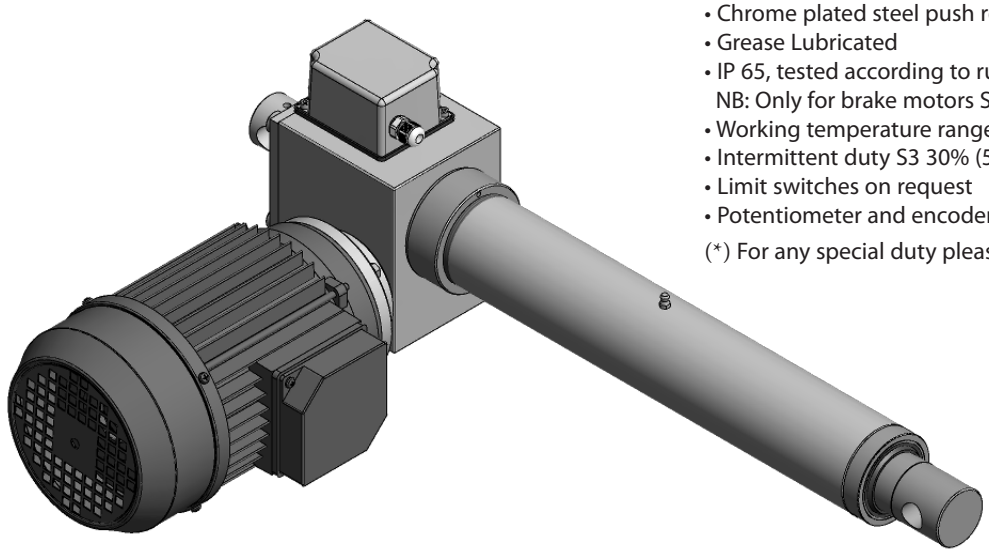




ALI5-P = See pictures
ALI5-P-FCM stroke < 500 = + 40 mm
ALI5-P-FCI stroke < 500 = + 30 mm
ALI5-P-VRS stroke < 500 = + 88 mm
ALI5-P-VRS-FCM stroke < 500 = + 128 mm
ALI5-P-VRS-FCI stroke < 500 = + 118 mm

ALI5-P stroke > 500 = + 20 mm
ALI5-P-FCM stroke > 500 = + 60 mm
ALI5-P-FCI stroke > 500 = + 50 mm
ALI5-P-VRS stroke > 500 = + 108 mm
ALI5-P-VRS-FCM stroke > 500 = + 148 mm
ALI5-P-VRS-FCI stroke > 500 = + 138 mm

with safety nut "G"= + 50 mm (i.e. ALI5-P "G" option = +50)
antirotation device "L" = + 15 mm
Bellows = + 25 mm (excluding FCM and FCI. For version FCM and FCI contact MecVel)



## Model AV3 CE

- A.C. motor, flange B14 - CE
- Worm gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Grease Lubricated
- IP 65, tested according to rule CEI EN 60529
  NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a 30°C(*)
- Limit switches on request
- Potentiometer and encoder on request

(*) For any special duty please contact our technical dept.

| | AV3 (Vac 3-phase) | | | | | |
|---|---|---|---|---|---|---|
| | *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) |
| * | 13000 | 55 | M01 | IEC90 | 3.00 | 2800 |
| | 20000 | 30 | M02 | IEC90 | 3.00 | 2800 |
| | 25000 | 20 | M03 | IEC80 | 1.80 | 2800 |
| | 25000 | 10 | M04 | IEC80 | 1.10 | 1400 |
| | 25000 | 5 | M05 | IEC80 | 0.75 | 1400 |

| | AV3 VRS (ballscrew) (Vac 3-phase) | | | | | |
|---|---|---|---|---|---|---|
| | *Fmax* (N) | *Speed* (mm/s) | *Version* | *Motor size* | *Motor power* (KW) | *Motor speed* (rpm) |
| * | 8000 | 45 | M01 | IEC80 | 0.75 | 2800 |
| | 13000 | 22 | M02 | IEC80 | 0.55 | 1400 |
| | 25000 | 15 | M03 | IEC80 | 0.75 | 2800 |
| | 25000 | 7 | M04 | IEC80 | 0.55 | 1400 |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

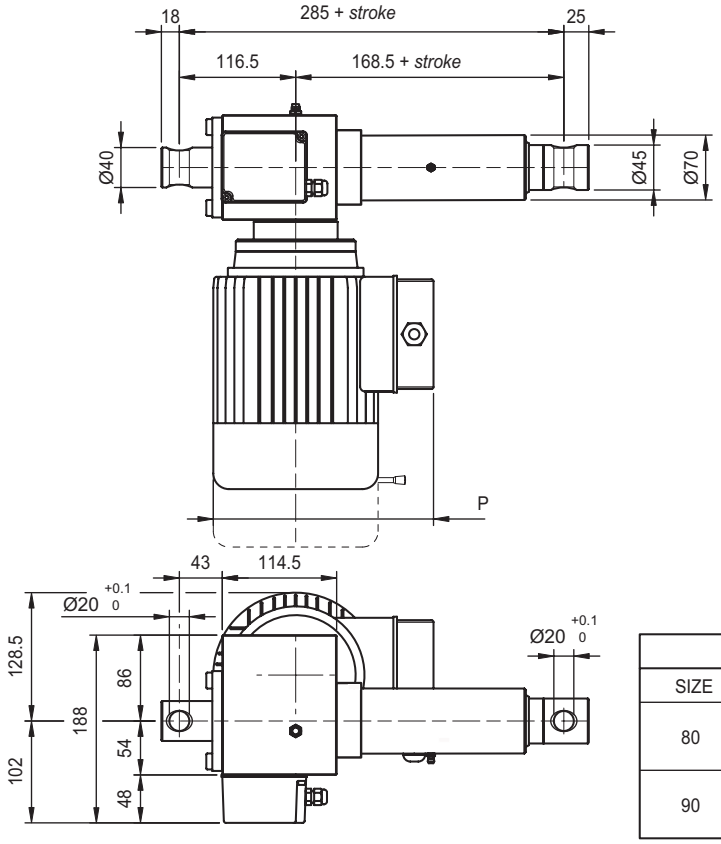
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

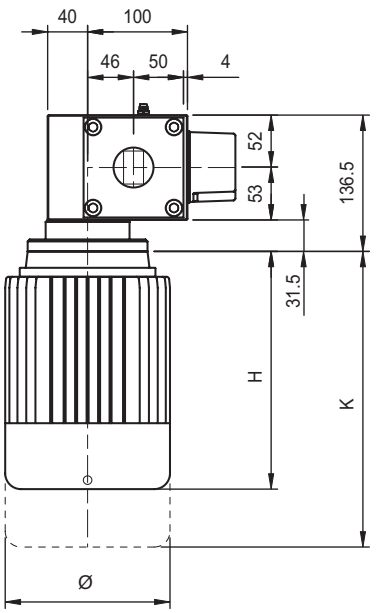
ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL AV3-F or AV3-FCM) OR PUT THEM ON MACHINE/FRAME.

MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

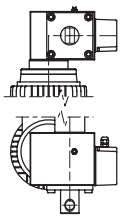
## AV3-F *Version with limitswitches*



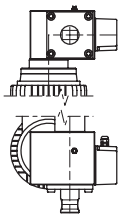




| *A.C. MOTORS DIMENSIONS* | | | | | |
|---|---|---|---|---|---|
| SIZE | VERSION | H | K | Ø | P |
| 80 | Standard | 238 | | 165 | 220 |
| | *Brake motors* | | 296 | | |
| 90 | Standard | 280 | | 182 | 251 |
| | *Brake motors* | | 344 | | |

**REAR ENDS**

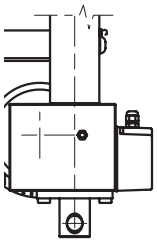


P1 Standard



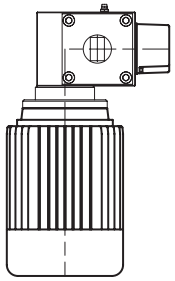
P2 Rotated 90°

**E-BOX POSITION**



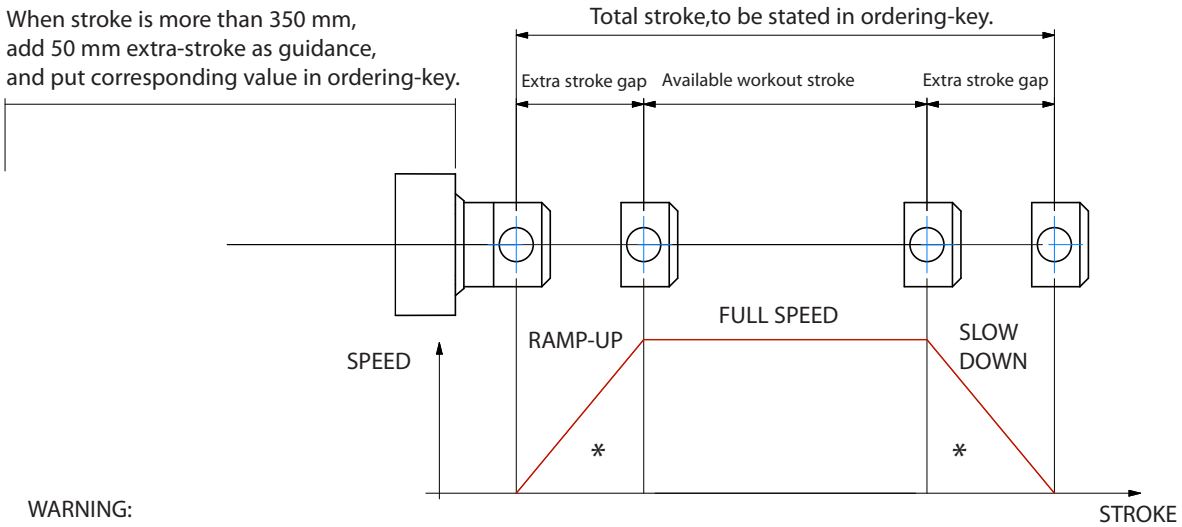
1 Standard

**MOTOR AND LIMIT SWITCHES POSITION**



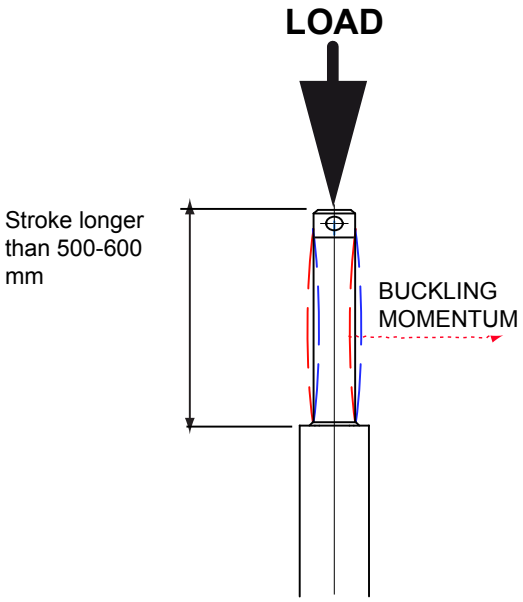
M1-FC1
Standard

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is > 40mm/s !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.

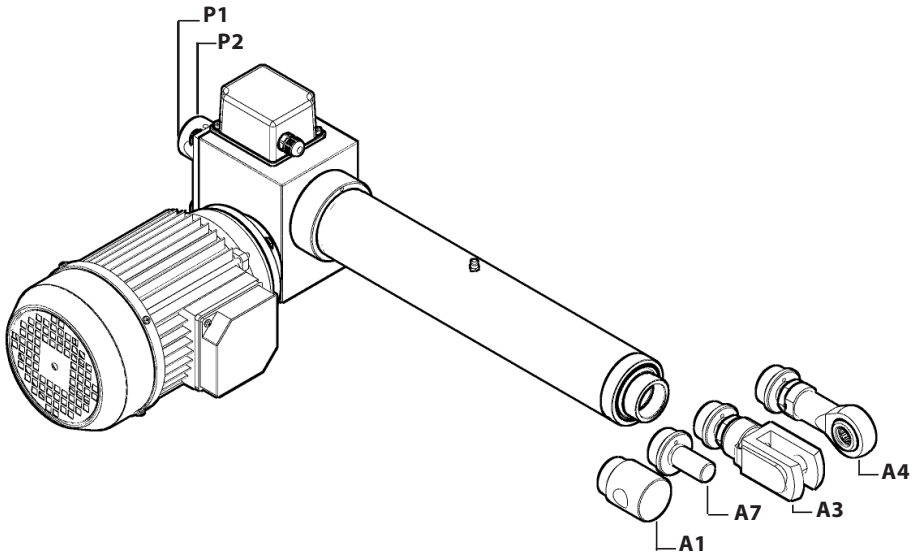


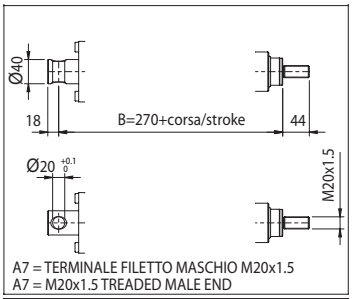

IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

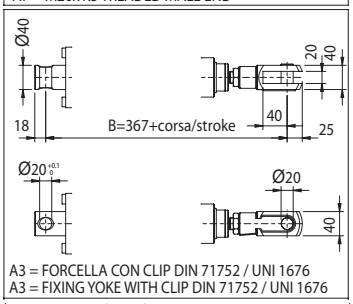
**AV3 / 0250 / M01 / CA-400/50-T-56-4-0,09 / AB / M1-FC1 / 1 / E05 / 2FC2 / P0T01A / P1 / A1**

**MODEL:**
AV3 AV3-VRS
**STROKE:**
es. 250 mm = 0250
**VERSION:** (pag. 49)
M01 / M02 / M03 / M04 / M05
M01 / M02 / M03 / M04 (*Version* VRS ballscrew)
M00 = Not standard speed
Flanged Version = Rpm
Advise reduction ratio and screw pitch
**MOTOR:** (pag. ACCESSORIES)
Advise only if with motor:
version, voltage, type, size, n°pole, power
With motorflange only put 0
With special motorflange put: PD
**AC MOTOR OPTIONS:** (pag. ACCESSORIES)
Motorflange: for motorflange version only advise size - i.e.for IEC80 B14 put 80B14
No motor: leave all following parameters blank
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)
**MOTOR AND LIMIT SWITCHES POSITION:**
**M1-FC1** None: Leave blank
**E-BOX POSITION:**
**1** No Motor: Leave blank
**ENCODER:** (pag. ACCESSORIES)
None: Leave blank
**LIMIT SWITCHES:** (pag. ACCESSORIES)
None: Leave blank
**POTENTIOMETER:** (pag. ACCESSORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) None: Leave blank
**REAR END:**
**P1** = Eyelet (standard) **P2** = Eyelet (90°)
**FRONT END:**
**A1** = Eyelet (Std pag. 50) **A4** = Rod end
**A3** = Yoke + Clip **A7** = M12 male
**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**

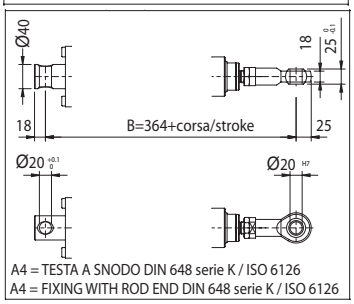


A7 = TERMINALE FILETTO MASCHIO M20x1.5
A7 = M20x1.5 TREADED MALE END



A3 = FORCELLA CON CLIP DIN 71752 / UNI 1676
A3 = FIXING YOKE WITH CLIP DIN 71752 / UNI 1676



A4 = TESTA A SNODO DIN 648 serie K / ISO 6126
A4 = FIXING WITH ROD END DIN 648 serie K / ISO 6126

***Note:*** *"B" dimension changes according to model*

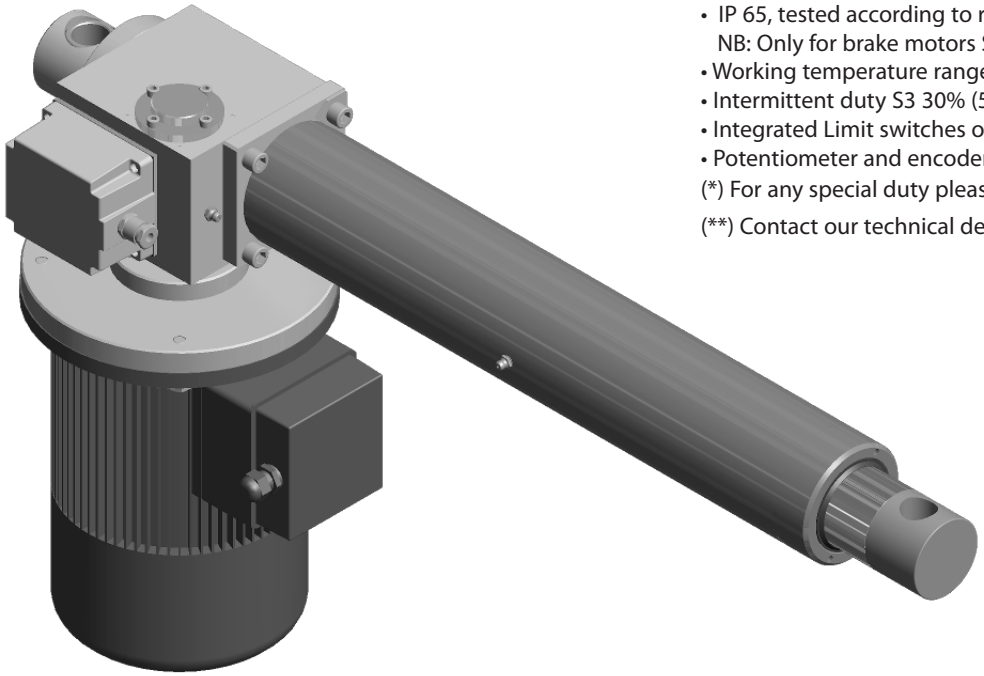
AV3 = See pictures
With safety nut "G" = + 40 mm
AV3-VRS = + 20 mm
Bellows = + 25mm

## ECV9092 Model CE

- A.C. motor, flange B5 - CE
- Worm gearbox
- Acme lead screw or ballscrew (VRS) (**)
- Chrome plated steel push rod
- Grease Lubricated
- IP 65, tested according to rule CEI EN 60529
  NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10 C°+60 C°
- Intermittent duty S3 30% (5 min) a 30°C (*)
- Integrated Limit switches on request
- Potentiometer and encoder on request

(*) For any special duty please contact our technical dept.

(**) Contact our technical dept.



| | ECV9092 (Vac 3-phase) | | | | | |
|---|---|---|---|---|---|---|
| | ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** |
| * | 15000 | 45 | M01 | IEC100 | 0.09 | 1400 |
| | 25000 | 24 | M02 | IEC100 | 0.09 | 1400 |
| | 40000 | 10 | M03 | IEC100 | 0.09 | 1400 |
| | 40000 | 5 | M04 | IEC90 | 0.09 | 1400 |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

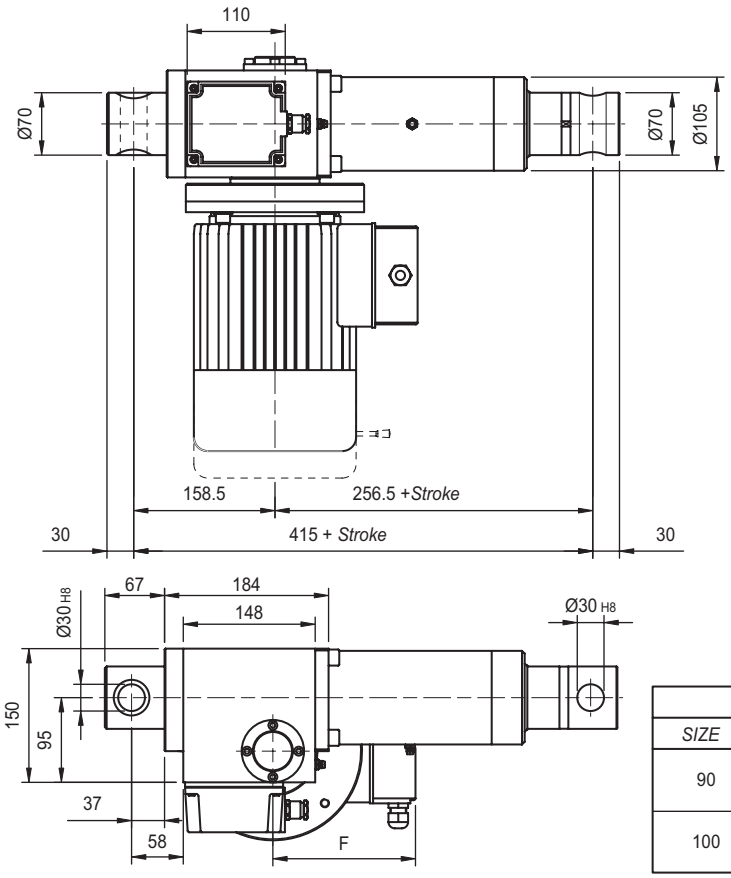
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

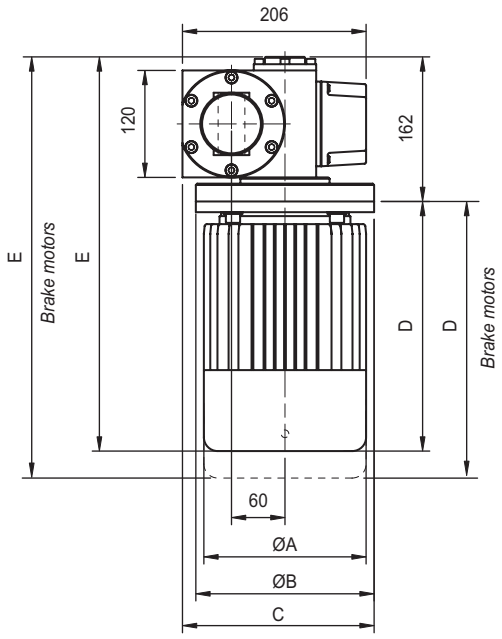
ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL AV3-F or AV3-FCM) OR PUT THEM ON MACHINE/FRAME.

MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

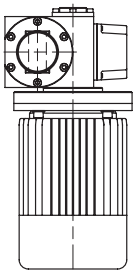
## ECV9092 *Version with limitswitches*



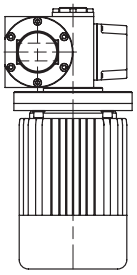




| A.C. MOTORS DIMENSIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| *SIZE* | *TYPE* | ØA | ØB | C | D | E | F |
| 90 | Standard | 182 | 200 | 215 | 280 | 442 | 160 |
| | *Brake motors* | | | | 344 | 506 | |
| 100 | Standard | 201 | 250 | 240 | 309 | 471 | 173 |
| | *Brake motors* | | | | 374 | 536 | |

**REAR ENDS**

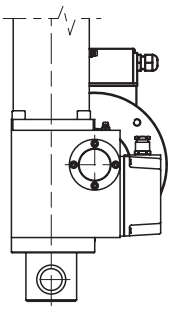


P1 Standard



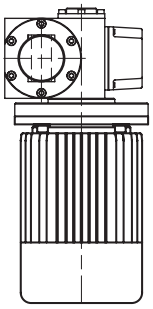
P2 Rotated 90°

**E-BOX POSITION**

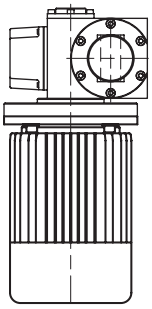


1 Standard

**MOTOR AND LIMIT SWITCHES POSITION**

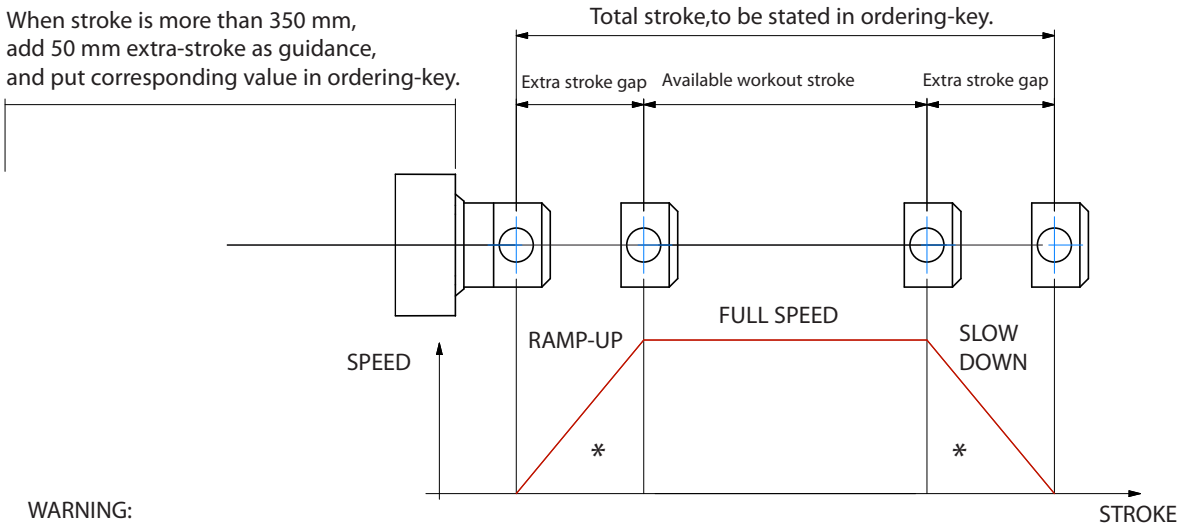


M0 (Standard)



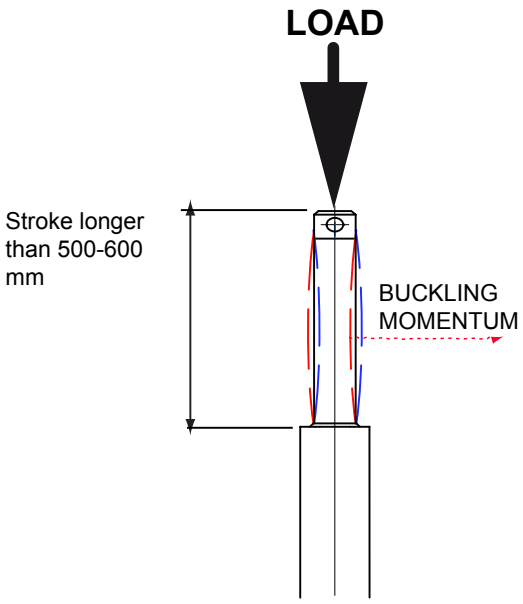
M1 (Sx)

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is > 40mm/s !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.

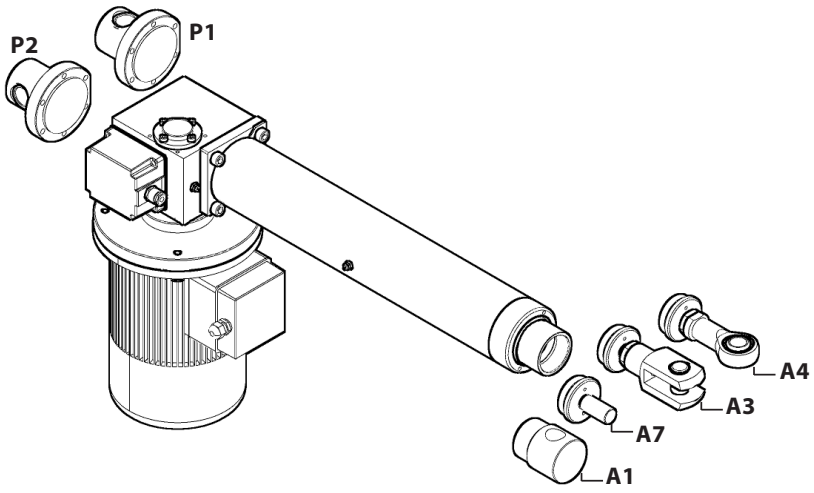



IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

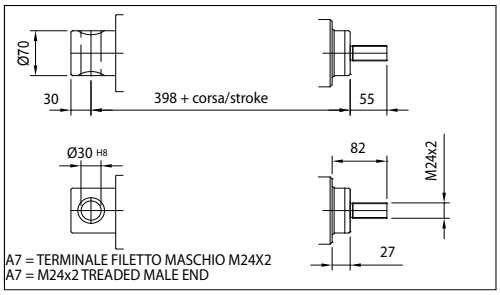
## ORDERING KEY

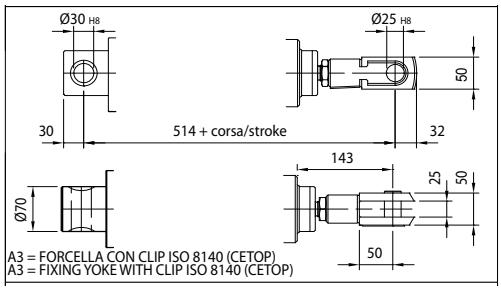
**ECV9092 / 0250 / M01 / CA-400/50-T-90-4-1,5 / 90B5+AB / 1/ M1 / E05 / 2FC2 / P0T01A / P1 / A1**

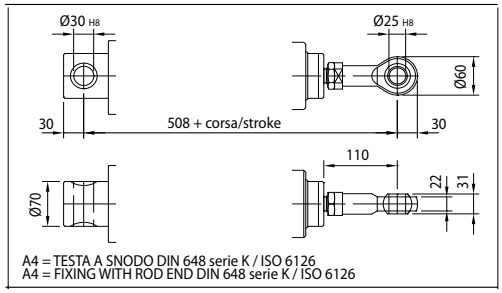
**MODEL:**
ECV9092
**STROKE:** mm
es. 250 mm = 0250
**VERSION:** (pag. 53)
M01 / M02 / M03 / M04
M00 = Not standard speed
Flanged Version:
Advise reduction ratio and screw pitch
**MOTOR:** (pag. ACCESSORIES)
Advise only if with motor:
version, voltage, type, size, n°pole, power
With motorflange only put 0
With special motorflange put: PD
**AC MOTOR OPTIONS:** (pag. ACCESSORIES)
Motorflange: for motorflange version only advise size - i.e.for IEC80 B14 put 80B14
No motor: leave all following parameters blank
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)
**E-BOX POSITION:**
**1** No motor: Leave blank
**MOTOR POSITION:**
**M0 =** standard **M1** = SX
**ENCODER:** (pag. ACCESSORIES)
None: Leave blank
**LIMIT SWITCHES:** (pag. ACCESSORIES)
None: Leave blank
**POTENTIOMETER:** (pag. ACCESSORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) None: Leave blank
**REAR END:**
**P1** = Eyelet (standard) **P2** = Eyelet (90°)
**FRONT END:**
**A1** = Eyelet (Std pag. 54) **A3** = Yoke + Clip
**A4** = Rod end **A7** = M12 male
**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION.**



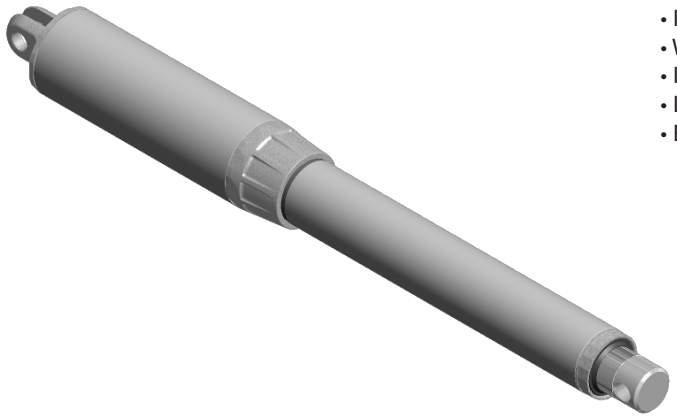

***Note:*** *"B" dimension changes according to model*
ECV9092 = See pictures
Bellows = + 25 mm
with safety nut "G" = +50 mm



## L02-Model CE



- Permanent magnet motor
- Planetary gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Permanent grease lubrication
- IP 65, tested according to rule CEI EN 60529
- Working temperature range -10°C +60°C
- Intermittent duty (see performance charts) a 30°C*
- Limit switches on request
- Encoder on request

(*) For any special duty please contact our technical dept.

| | L02 (Vdc) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Fmax (N)* | *Speed (mm/s)* | *Version* | *Motor size* | *Motor power (KW)* | *Motor speed (rpm)* | *Max Current for Fmax(A) 24Vdc* | ** |
| * | 280 | 100 | M01 | 36 | - | 500 | 4 | |
| * | 220 | 60 | M02 | 36 | - | 300 | 1,8 | |
| * | 240 | 40 | M03 | 36 | - | 300 | 1,8 | |
| | 750 | 30 | M04 | 36 | - | 150 | 2,8 | |
| | 840 | 20 | M05 | 36 | - | 150 | 2,8 | |
| | 1600 | 10 | M06 | 36 | - | 150 | 2,6 | |
| | 2000 | 5 | M07 | 36 | - | 80 | 1,7 | |

| | L02 (Vdc) ballscrew | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Fmax (N)* | *Speed (mm/s)* | *Version* | *Motor size* | *Motor power (KW)* | *Motor speed (rpm)* | *Max Current for Fmax(A) 24Vdc* | ** |
| * | 1000 | 42 | M01 | 36 | - | 500 | 4 | |
| | 1000 | 25 | M02 | 36 | - | 300 | 1,7 | |
| | 2000 | 12 | M03 | 36 | - | 150 | 2 | |
| | 2000 | 6 | M04 | 36 | - | 80 | 1,2 | |

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section.

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

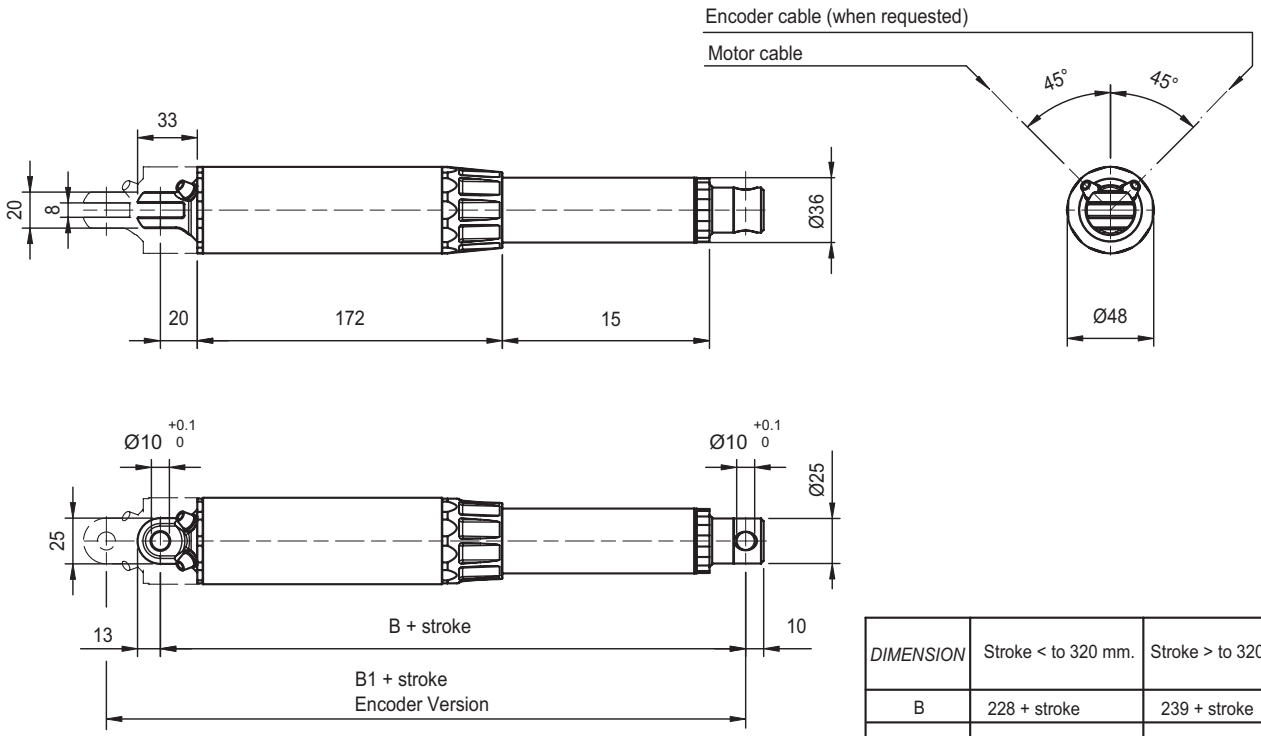
BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

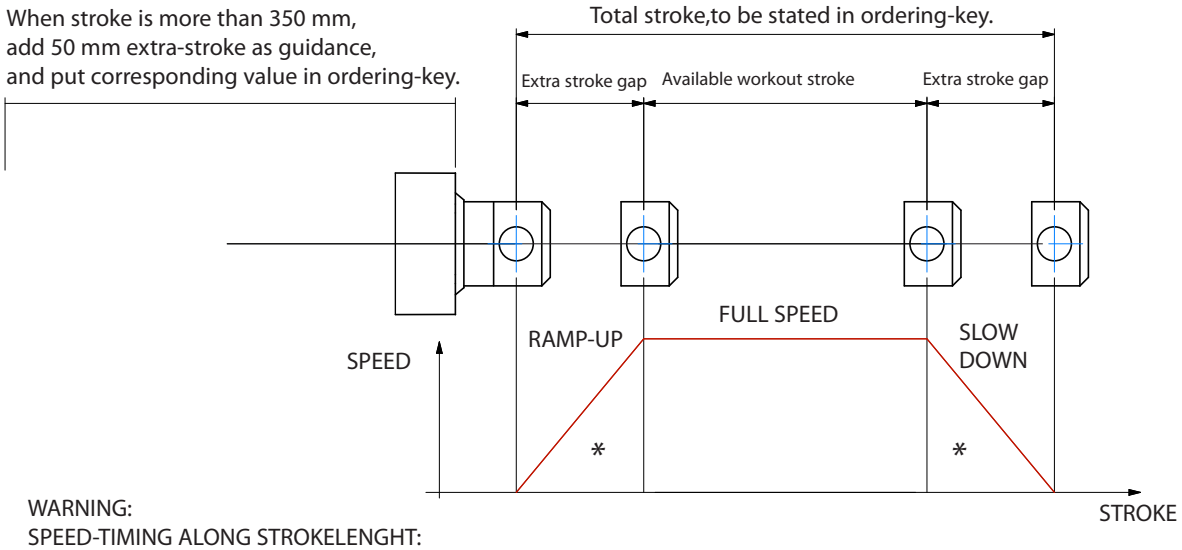
CONSIDER MECVEL's LIMITSWITCHES ( MODEL L02-F or L02-FCM) OR PUT THEM ON MACHINE/FRAME.

## L02 *Version without limitswitches*



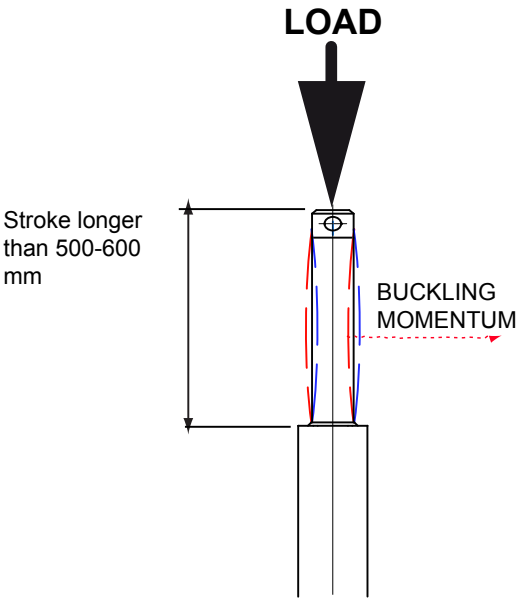

| *DIMENSION* | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|
| B | 228 + stroke | 239 + stroke |
| B1 | 257 + stroke | 268 + stroke |

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important with high speed !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.

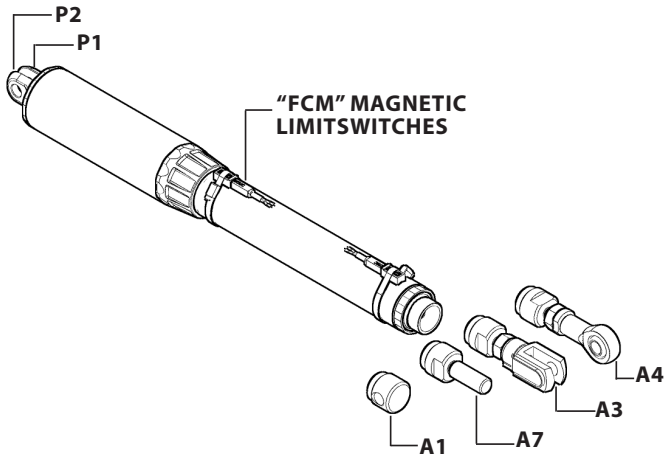


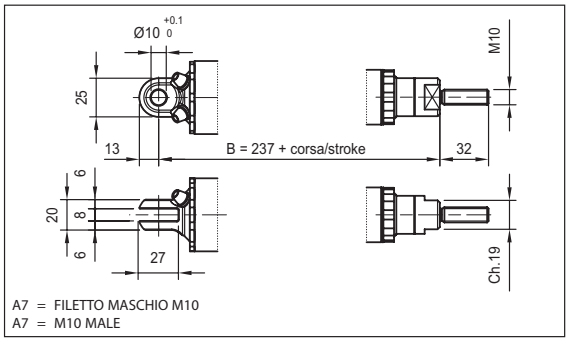

IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

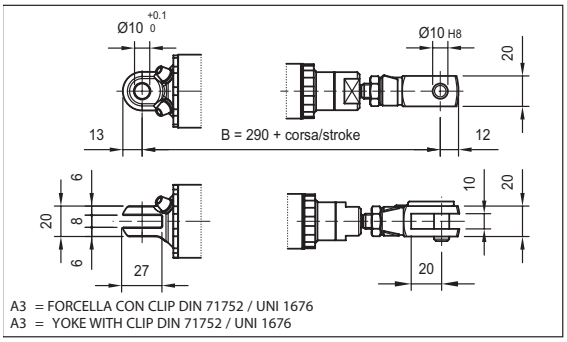
**L02 / 0250 / M01 / 24 / 2FCM0 / E10 / P1 / A1**

**MODEL:**
L02 L02-FCM L02-VRS
**STROKE:**
es. 250 mm = 0250
min 50; with 50 as incremental
**VERSION:** (Pag. 57)
M00 = Not standard speed
**MOTOR:** (Pag. ACCESSORIES)
**12** = 12 Vdc
**24** = 24 Vdc
**LIMIT SWITCHES:** (Pag. ACCESSORIES)
None: Leave blank
**ENCODER :** (Pag. ACCESSORIES)
**E10:** Encoder 1 channel 4 ppr NPN (open Collector)
**REAR END:**
**P1** = Yoke (standard)
**P2** = Special (provide drawing)
**FRONT END:**
**A1** = Eyelet (Std pag.58)
**A3** = Yoke + Clip
**A4** = Rod end
**A7** = M10 male
**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**

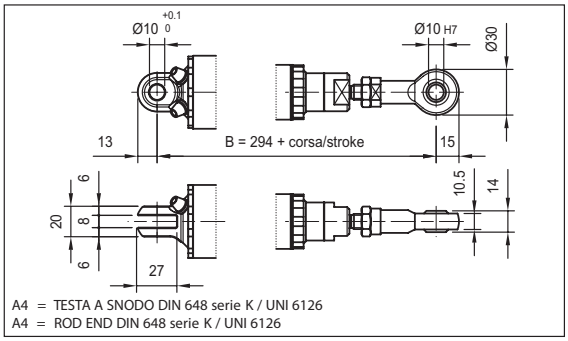



A7 = FILETTO MASCHIO M10
A7 = M10 MALE

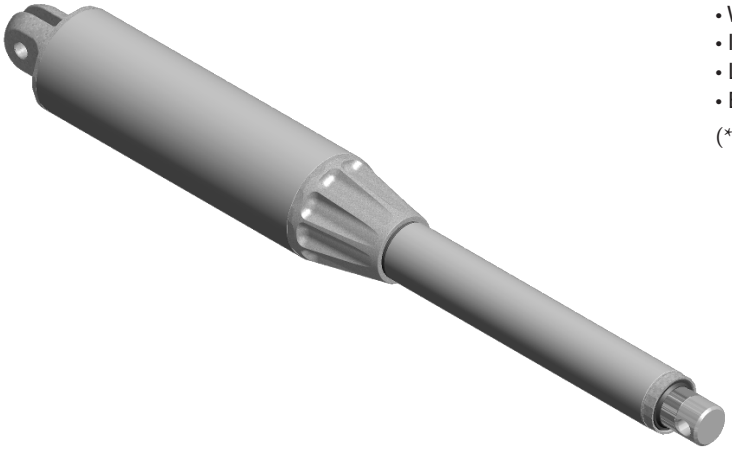



A3 = FORCELLA CON CLIP DIN 71752 / UNI 1676
A3 = YOKE WITH CLIP DIN 71752 / UNI 1676




A4 = TESTA A SNODO DIN 648 serie K / UNI 6126
A4 = ROD END DIN 648 serie K / UNI 6126

***Note:*** *"B" dimension changes according to model*
***Note:*** *With encoder, dimension "B" is 30 mm longer*
L02 = See pictures
L02 stroke > 320 mm = + 11 mm
L02-FCM = + 34 mm
L02-FCM stroke > 320 mm = + 45 mm
with safety nut "G" = + 30 mm
L02-VRS = + 40 mm
Bellows + 20mm ( no for versions FCM )



## L03-Model CE

- Permanent magnet motor
- Planetary gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Permanent grease lubrication
- IP 65, tested according to rule CEI EN 60529
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a 30°C*
- Limit switches on request
- Encoder on request

(*) For any special duty please contact our technical dept.

| L03 (Vdc) | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** | ***Max Current for F max(A) 24Vdc*** | ** |
| 3000 | 20 | M01 | 51 | - | 155 | 11 | |
| 5000 | 10 | M02 | 51 | - | 155 | 10 | |
| 2000 | 30 | M03 | 51 | - | 155 | 10,2 | |

| L03-VRS (Vdc) ballscrew | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Fmax* (N)** | ***Speed* (mm/s)** | ***Version*** | ***Motor size*** | ***Motor power* (KW)** | ***Motor speed* (rpm)** | ***Max Current for F max(A) 24Vdc*** | ** |
| 5000 | 13 | M01 | 51 | - | 155 | 2,9 | |

When strokes are longer than 350mm, check STROKE SETUP section.

** For 12 Vdc power supply currents are doubled and loads are 20% lower.

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

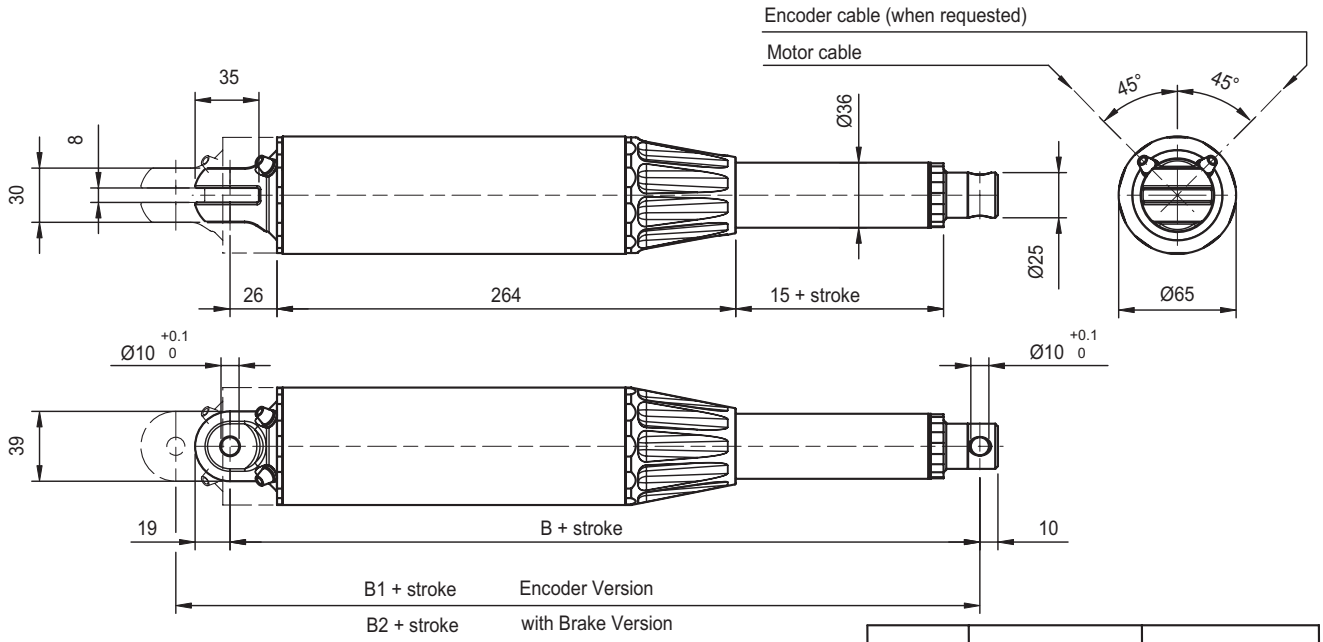
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL L03-F or L03-FCM) OR PUT THEM ON MACHINE/FRAME.

⚠ MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

## L03 *Version without Limitswitches*

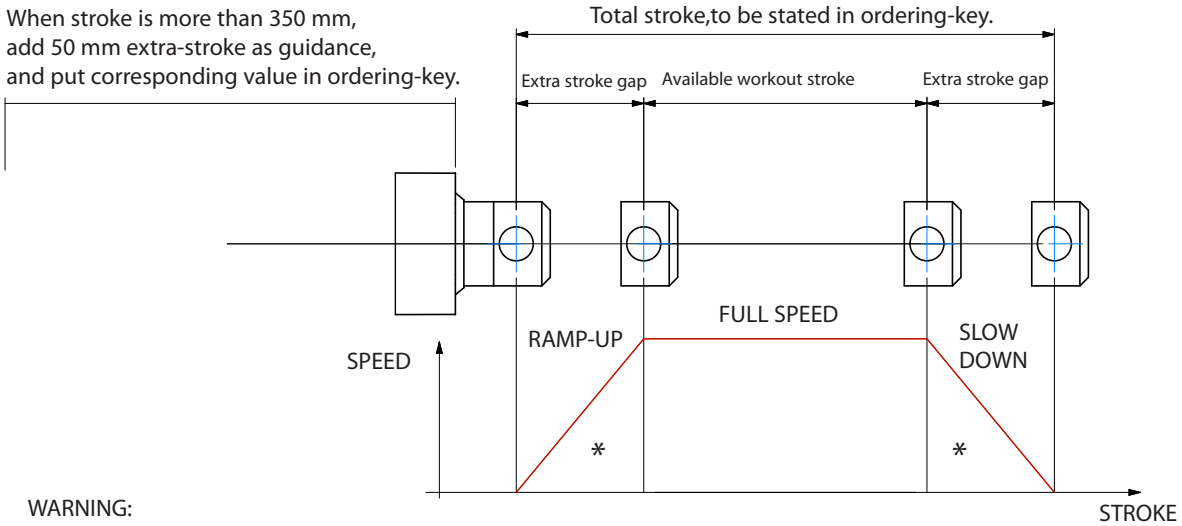



| | DIMENSION | Stroke < to 320 mm. | Stroke > to 320 mm. |
|---|---|---|---|
| Version without Encoder and Brake | B | 325 + stroke | 336 + stroke |
| Version without Encoder | B1 | 355 + stroke | 366 + stroke |
| Version without Brake | B2 | 355 + stroke | 366 + stroke |

For VRS and FCM versions see page 64.

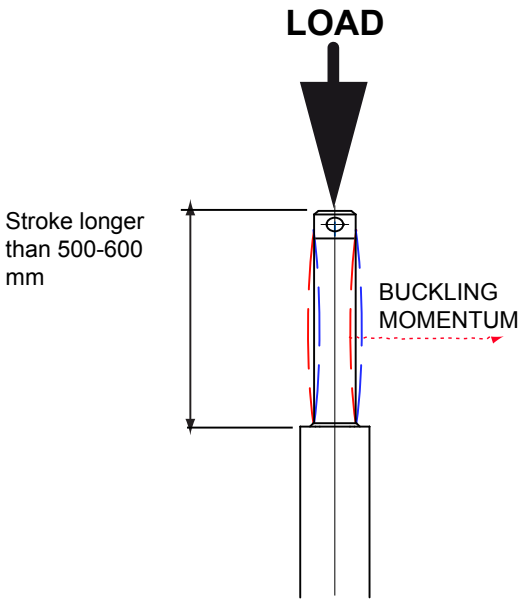
VERSION WITH BRAKE IS not compatible with VERSION WITH ENCODER

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important with high speed !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.



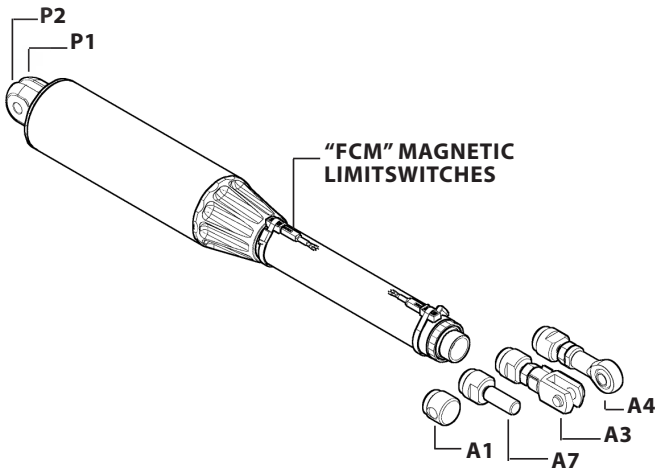

IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

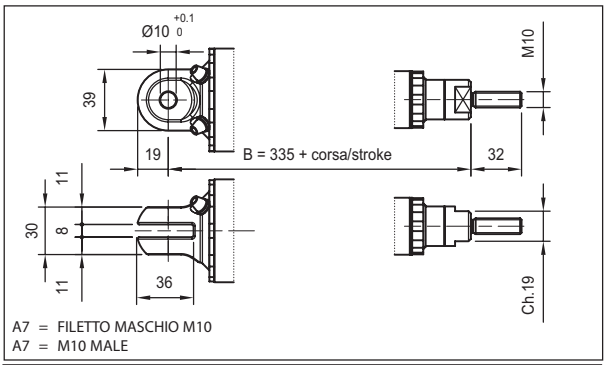
## ORDERING KEY

**L03 / 0250 / M01 / 24 / 2FCM0 / E10 / P1 / A1**

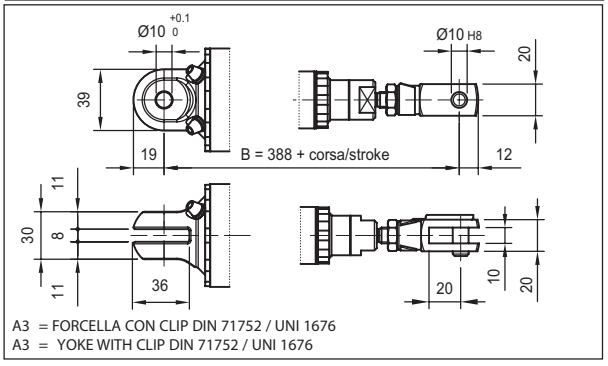
**MODEL:**
L03 L03-FCM L03-VRS
**STROKE:**
es. 250 mm = 0250
min 50; with 50 as incremental
**VERSION:** (Pag.61)
M00 = Not standard speed
**MOTOR:** (Pag. ACCESSORIES)
**12** = 12 Vcc
**24** = 24 Vccc
**LIMIT SWITCHES:** (Pag. ACCESSORIES)
None: Leave blank
**ENCODER:** (Pag. ACCESSORIES)
**E50:** Encoder 2 channel 4 ppr NPN (open Collector)
**REAR END:**
**P1** = Yoke (standard)
**P2** = Special (provide drawing)
**FRONT END:**
**A1** = Eyelet (Std pag.62)
**A3** = Yoke + Clip
**A4** = Rod end
**A7** = M10 male

**NOTE: COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION**

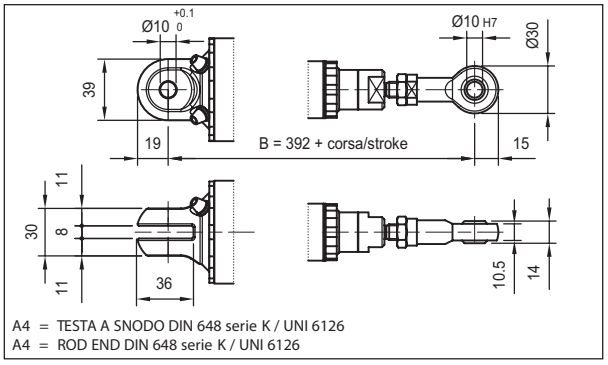



A7 = FILETTO MASCHIO M10
A7 = M10 MALE

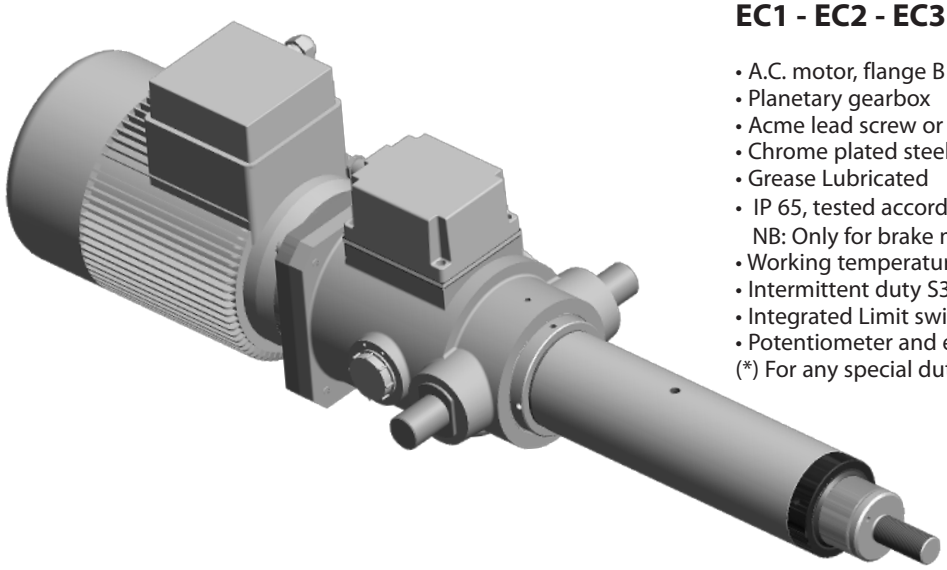



A3 = FORCELLA CON CLIP DIN 71752 / UNI 1676
A3 = YOKE WITH CLIP DIN 71752 / UNI 1676




A4 = TESTA A SNODO DIN 648 serie K / UNI 6126
A4 = ROD END DIN 648 serie K / UNI 6126

***Note:*** *"B" dimension changes according to model*
***Note:*** *With encoder, dimension "B" is 30 mm longer*
L03 = See pictures - L03 stroke > 320 mm = + 11 mm
L03-FCM = + 34 mm - L03-FCM stroke > 320 mm = + 44 mm
with safety nut "G" = + 30mm
L03-VRS = + 40 mm



## EC1 - EC2 - EC3 - EC4 - EC5 Models CE

- A.C. motor, flange B14 - CE
- Planetary gearbox
- Acme lead screw or ballscrew (VRS)
- Chrome plated steel push rod
- Grease Lubricated
- IP 65, tested according to rule CEI EN 60529
  NB: Only for brake motors Standard IP54, IP65 on request
- Working temperature range -10°C +60°C
- Intermittent duty S3 30% (5 min) a 30°C*
- Integrated Limit switches for standard
- Potentiometer and encoder on request

(*) For any special duty please contact our technical dept.

**EC1(Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 500 | 193 | M01 | IEC63 | 0.37 | 2800 |
| * | 1250 | 97 | M02 | IEC71 | 0.37 | 1400 |
| * | 2000 | 60 | M03 | IEC71 | 0.37 | 900 |
| | 5000 | 24 | M04 | IEC71 | 0.55 | 1400 |
| | 5000 | 15 | M05 | IEC71 | 0.25 | 900 |
| | 5000 | 6 | M06 | IEC63 | 0.13 | 1400 |

**EC1 VRS (ballscrew) (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 500 | 230 | M01 | IEC63 | 0.18 | 2800 |
| * | 1250 | 115 | M02 | IEC63 | 0.18 | 1400 |
| * | 2000 | 75 | M03 | IEC71 | 0.25 | 900 |
| | 5000 | 30 | M04 | IEC63 | 0.18 | 1400 |
| | 5000 | 19 | M05 | IEC71 | 0.18 | 900 |
| | 5000 | 7 | M06 | IEC63 | 0.13 | 1400 |

**EC2 (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 1000 | 193 | M01 | IEC80 | 0.75 | 2800 |
| * | 2500 | 97 | M02 | IEC80 | 0.75 | 1400 |
| * | 2500 | 60 | M03 | IEC80 | 0.55 | 900 |
| | 10000 | 24 | M04 | IEC80 | 1.1 | 1400 |
| | 10000 | 15 | M05 | IEC80 | 0.55 | 900 |
| | 10000 | 6 | M06 | IEC71 | 0.25 | 1400 |

**EC2 VRS (ballscrew) (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 1250 | 230 | M01 | IEC71 | 0.37 | 1400 |
| * | 2500 | 150 | M02 | IEC80 | 0.55 | 900 |
| * | 5000 | 60 | M03 | IEC71 | 0.37 | 1400 |
| | 10000 | 35 | M04 | IEC80 | 0.55 | 900 |
| | 10000 | 15 | M05 | IEC63 | 0.18 | 1400 |

**EC3 (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 2500 | 193 | M01 | IEC90 | 2.20 | 2800 |
| * | 5000 | 97 | M02 | IEC90 | 1.80 | 1400 |
| * | 5000 | 60 | M03 | IEC90 | 1.50 | 900 |
| | 15000 | 24 | M04 | IEC90 | 1.80 | 1400 |
| | 15000 | 15 | M05 | IEC90 | 1.10 | 900 |
| | 15000 | 6 | M06 | IEC71 | 0.37 | 1400 |

**EC3 VRS (ballscrew) (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 3000 | 230 | M01 | IEC80 | 0.75 | 1400 |
| * | 3000 | 150 | M02 | IEC80 | 0.55 | 900 |
| * | 10000 | 60 | M03 | IEC80 | 0.75 | 1400 |
| | 15000 | 35 | M04 | IEC80 | 0.55 | 900 |
| | 15000 | 15 | M05 | IEC71 | 0.25 | 1400 |

**EC4 (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 15000 | 56 | M01 | IEC112 | 2.20 | 900 |
| * | 25000 | 42 | M02 | IEC100 | 4.00 | 1400 |
| | 30000 | 25 | M03 | IEC112 | 3.00 | 900 |
| | 30000 | 10 | M04 | IEC90 | 1.50 | 1400 |

**EC4 VRS (ballscrew) (Vac)**

| | Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|---|
| * | 25000 | 60 | M01 | IEC90 | 1.80 | 1400 |
| | 30000 | 35 | M02 | IEC100 | 1.50 | 900 |
| | 30000 | 15 | M03 | IEC90 | 1.10 | 1400 |

**EC5 (Vac)**

| Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|
| 50000 | 11 | M01 | IEC100 | 3.00 | 1400 |
| 50000 | 7 | M02 | IEC100 | 2.20 | 900 |

**EC5 VRS (ballscrew) (Vac)**

| Fmax (N) | Speed (mm/s) | Version | Motor size | Motor power (KW) | Motor speed (rpm) |
|---|---|---|---|---|---|
| 50000 | 15 | M01 | IEC90 | 1.10 | 1400 |
| 50000 | 10 | M02 | IEC90 | 0.75 | 900 |

With single-phase motors type M (see motor choice guideline in paragraph ACCESSORIES) performances are 20% lower than the three-phase motor.

* When speed is more than 40 mm/s and/or strokes longer than 350mm, check STROKE SETUP section; BRAKEMOTOR IS RECOMMENDED

BEFORE OPERATING ACTUATOR MAKE SURE YOU READ AND UNDERSTOOD BASIC OPERATIONAL INSTRUCTIONS SHOWN ON USERMANUALS, AVAILABLE FROM WEBSITE.

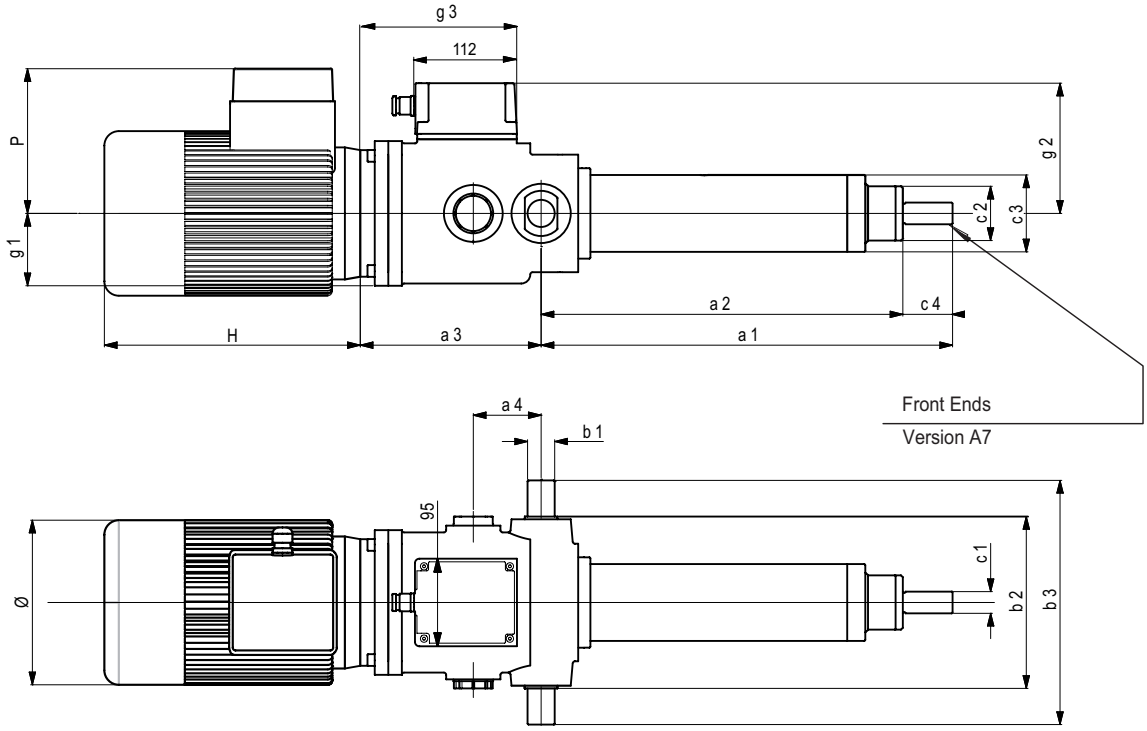
THIS DOCUMENT DISPLAYS MOST TYPICAL STANDARD FEATURES AND SETUPS: CONTACT OUR OFFICES FOR MORE.

ACTUATOR SHALL NOT COME TO **MECHANICAL STROKE-END**, TO **AVOID FAILURES**.

CONSIDER MECVEL's LIMITSWITCHES ( MODEL EC or EC-F) OR PUT THEM ON MACHINE/FRAME.

MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.

## EC1 / 2 / 3




| SIZE | DIMENSIONS TABLE | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1) a1 | 1) a2 | 2) a3 | a4 | (Øh7) b1 | b2 | b3 | c1 | c2 | c3 | c4 | g1 | g2 | 2) g3 |
| 1 | 145 | 111 | * | 61 | Ø14 | 105 | 145 | M10 | Ø30 | Ø50 | 34 | 50 | 103 | * |
| 2 | 167 | 123 | * | 66 | Ø20 | 140 | 200 | M12 | Ø50 | Ø70 | 44 | 65 | 118 | * |
| 3 | 255 | 200 | * | 75 | Ø30 | 190 | 270 | M18 | Ø60 | Ø85 | 55 | 80 | 138 | * |

| SIZE | BALLSCREW DIMENSIONS TABLE | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1) a1 | 1) a2 | 2) a3 | a4 | (Øh7) b1 | b2 | b3 | c1 | c2 | c3 | c4 | g1 | g2 | 2) g3 |
| 1 | 169 | 135 | * | 61 | Ø14 | 105 | 145 | M10 | Ø30 | Ø50 | 30 | 50 | 103 | * |
| 2 | 233 | 189 | * | 66 | Ø20 | 140 | 200 | M12 | Ø50 | Ø70 | 35 | 65 | 118 | * |
| 3 | 317 | 262 | * | 75 | Ø30 | 190 | 270 | M18 | Ø60 | Ø85 | 45 | 80 | 138 | * |

1) Dimensions are valid for stroke = 0, for the exact overall dimension add the wanted stroke in mm.
2) Dimensions change according to actuator model. See charts sidewards.

| A.C. MOTORS DIMENSIONS | | | | |
|---|---|---|---|---|
| SIZE | VERSIONE / TYPE | H | Ø | P |
| 63 | Standard | 185 | 123 | 110 |
| | Brake motors | 234 | | |
| 71 | Standard | 215 | 140 | 121 |
| | Brake motors | 267 | | |
| 80 | Standard | 238 | 159 | 138 |
| | Brake motors | 296 | | |
| 90 | Standard | 255 | 176 | 149 |
| | Brake motors | 319 | | |

| EC1 | | Version | | | | | |
|---|---|---|---|---|---|---|---|
| | | M01 | M02 | M03 | M04 | M05 | M06 |
| | a3 | 147 | 157 | 157 | 157 | 157 | 172 |
| | g3 | 131 | 141 | 141 | 141 | 141 | 156 |

| EC1-VRS | | Version | | | | | |
|---|---|---|---|---|---|---|---|
| | | M01 | M02 | M03 | M04 | M05 | M06 |
| | a3 | 147 | 147 | 157 | 147 | 157 | 172 |
| | g3 | 131 | 131 | 141 | 131 | 141 | 156 |

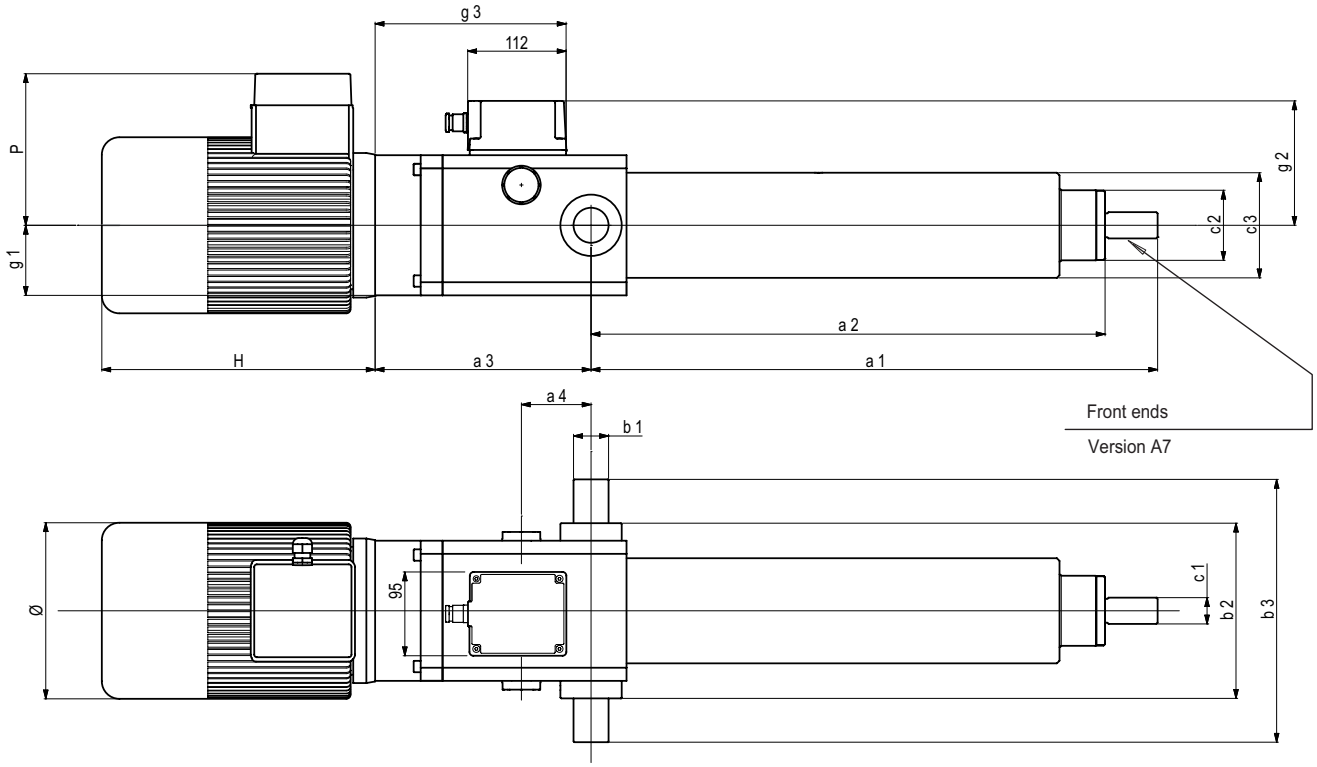
| EC2 | | Version | | | | | |
|---|---|---|---|---|---|---|---|
| | | M01 | M02 | M03 | M04 | M05 | M06 |
| | a3 | 182 | 182 | 182 | 182 | 182 | 201 |
| | g3 | 158 | 158 | 158 | 158 | 158 | 177 |

| EC2-VRS | | Version | | | | |
|---|---|---|---|---|---|---|
| | | M01 | M02 | M03 | M04 | M05 |
| | a3 | 169 | 182 | 169 | 182 | 201 |
| | g3 | 145 | 158 | 145 | 158 | 177 |

| EC3 | | Version | | | | | |
|---|---|---|---|---|---|---|---|
| | | M01 | M02 | M03 | M04 | M05 | M06 |
| | a3 | 200 | 200 | 200 | 200 | 200 | 226 |
| | g3 | 173 | 173 | 173 | 173 | 173 | 199 |

| EC3-VRS | | Version | | | | |
|---|---|---|---|---|---|---|
| | | M01 | M02 | M03 | M04 | M05 |
| | a3 | 188 | 188 | 188 | 188 | 226 |
| | g3 | 161 | 161 | 161 | 161 | 199 |

## EC4 / 5




| SIZE | DIMENSIONS TABLE | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1) a1 | 1) a2 | 2) a3 | a4 | Øh7 b1 | b2 | b3 | c1 | c2 | c3 | c4 | g1 | g2 | 2) g3 |
| 4 | 272 | 212 | * | 79.5 | 40 | 200 | 300 | M30x2 | 80 | 120 | 60 | 80 | 136 | * |
| 5 | 272 | 212 | * | 79.5 | 40 | 200 | 300 | M30x2 | 80 | 120 | 60 | 80 | 136 | * |

| SIZE | BALLSCREW DIMENSIONS TABLE | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1) a1 | 1) a2 | 2) a3 | a4 | Øh7 b1 | b2 | b3 | c1 | c2 | c3 | c4 | g1 | g2 | 2) g3 |
| 4 | 318 | 259 | * | 79.5 | 40 | 200 | 300 | M30x2 | 80 | 120 | 60 | 80 | 136 | * |
| 5 | 318 | 259 | * | 79.5 | 40 | 200 | 300 | M30x2 | 80 | 120 | 60 | 80 | 136 | * |

1) Dimensions are valid for stroke = 0, for the exact overall dimension add the wanted stroke in mm.
2) Dimensions change according to actuator model. See charts sidewards.

| A.C. MOTORS DIMENSIONS | | | | |
|---|---|---|---|---|
| SIZE | TYPE | H | Ø | P |
| 90 | Standard | 255 | 176 | 149 |
| | Brake motors | 319 | | |
| 100 | Standard | 309 | 195 | 173 |
| | Brake motors | 374 | | |
| 112 | Standard | 328 | 219 | 192 |
| | Brake motors | 407 | | |

| EC4 | | Version | | | |
|---|---|---|---|---|---|
| | | M01 | M02 | M03 | M04 |
| | a3 | 246.5 | 246.5 | 246.5 | 238.5 |
| | g3 | 218 | 218 | 218 | 210 |

| EC4-VRS | | Version | | |
|---|---|---|---|---|
| | | M01 | M02 | M03 |
| | a3 | 200.5 | 246.5 | 238.5 |
| | g3 | 172 | 218 | 210 |

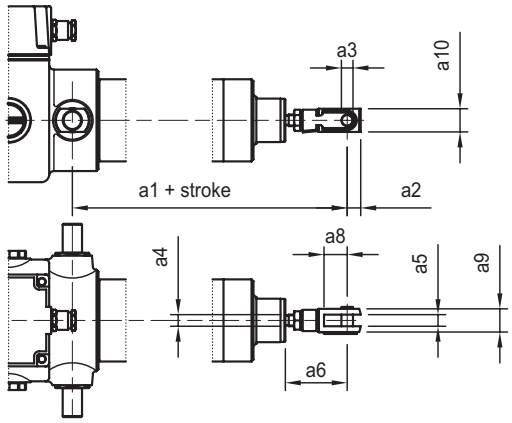
| EC5 | | Version | |
|---|---|---|---|
| | | M01 | M02 |
| | a3 | 284.5 | 284.5 |
| | g3 | 256 | 256 |

| EC5-VRS | | Version | |
|---|---|---|---|
| | | M01 | M02 |
| | a3 | 238.5 | 238.5 |
| | g3 | 210 | 210 |

# Front ends

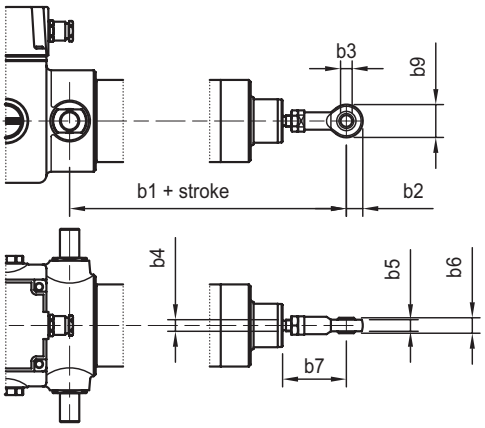
A3 = YOKE WITH CLIP DIN 71752 / UNI 1676

| SIZE | DIMENSIONS TABLE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | a1 | a1 VRS (BALLSCREW) | a2 | a3 | a4 | a5 | a6 | a8 | a9 | a10 |
| 1 | 172 | 196 | 14 | Ø12 | M12 | 12 | 61 | 24 | 24 | 24 |
| 2 | 220 | 286 | 25 | Ø20 | M20x1,5 | 20 | 97 | 40 | 40 | 40 |
| 3 | 317 | 379 | 35 | Ø25 | M24x2 | 25 | 117 | 50 | 50 | 50 |
| 4 / 5 | 345 | 392 | 38 | Ø30 | M27x2 | 30 | 131 | 54 | 55 | 55 |



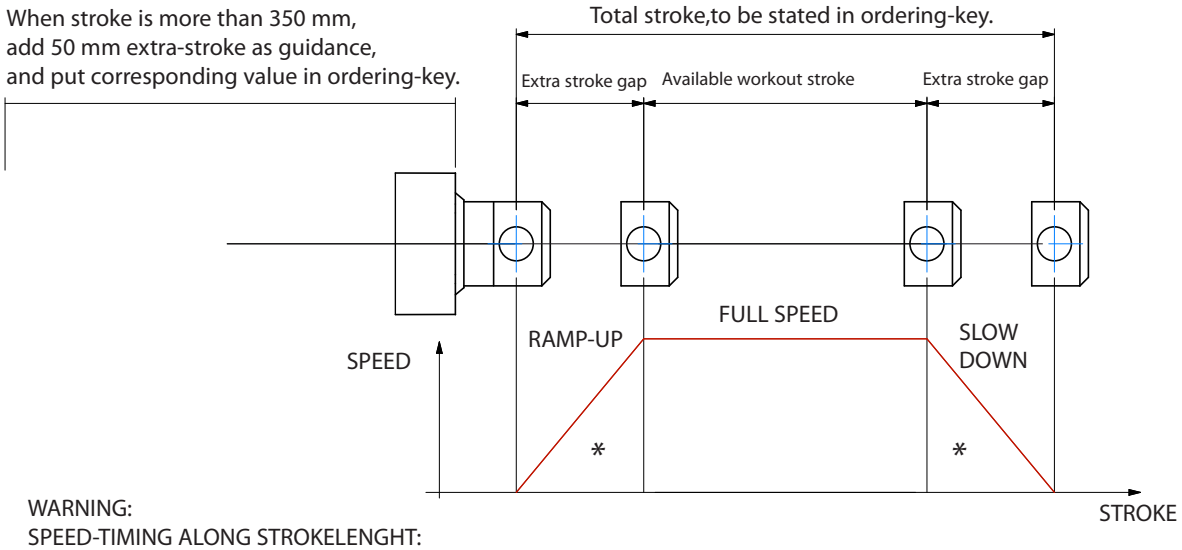

A4 = ROD END DIN 648 serie K / UNI 6126

| SIZE | DIMENSIONS TABLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | b1 | b1 VRS (BALLSCREW) | b2 | b3 (ØH7) | b4 | b5 | b6 | b7 | b9 |
| 1 | 174 | 198 | 16 | Ø12 | M12 | 12 | 16 | 63 | 32 |
| 2 | 217 | 283 | 25 | Ø20 | M20x1,5 | 18 | 25 | 94 | 50 |
| 3 | 313 | 375 | 30 | Ø25 | M24x2 | 22 | 31 | 113 | 60 |
| 4 / 5 | 345 | 392 | 35 | Ø30 | M27x2 | 25 | 37 | 131 | 70 |



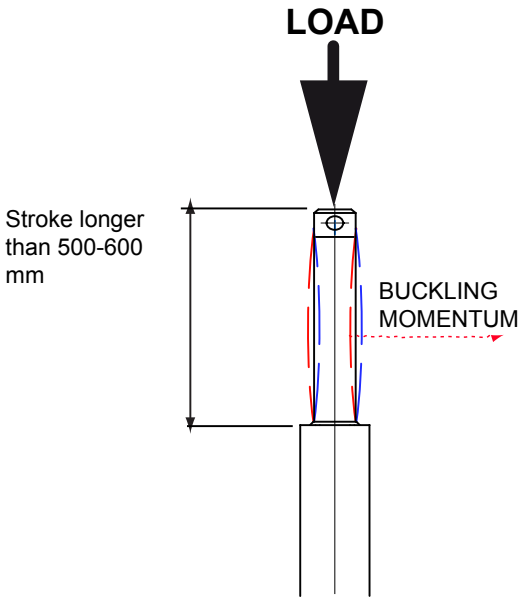

*Bellows* = +25 mm

***STROKE SETUP:*** Useful tips for handling stroke and avoid run-on-block collision.




WARNING:
SPEED-TIMING ALONG STROKELENGHT:
ramps are extremely important when speed is > 40mm/s !!! Inverter or PWM drive recommended!
* The more speed raises the more extra stroke has to raise too.

***BUCKLING:*** When stroke is longer than 500mm, BUCKLING can be a risk: please check mounting with our offices and/or see user-manuals.




IMPORTANT:
Long strokes, even if load is low, can generate significant buckling momentums, as sketch slows.
This happens when actuator is in its all-opened position: that's the reason why we recommend 100 mm extra-stroke.
Pushtube will have this100 mm-portion always inside the overtube, improving guidance against buckling.
For more information on this, contact our office.

## ORDERING KEY

**EC1 / 0250 / M01 / CA-400-50-T-56-4-0,09 / AB / E05 / 2FC2 / POT01A / A3**

**MODEL:**
EC1 / EC2 / EC3 / EC4 / EC5
EC1-VRS / EC2-VRS / EC3-VRS / EC4-VRS
EC5-VRS

**STROKE:**
es. 250 mm = 0250

**VERSION:** (Pag. 65)
Advise: choose among
M00 = Not standard speed
Flanged Version:
Advise reduction ratio and screw pitch

**MOTOR:** (Pag. ACCESSORIES)
Advise only if with motor:
version, voltage, type, size, n°pole, power
With motorflange only put 0
With special motorflange put: PD

**AC MOTOR OPTIONS:** (Pag. ACCESSORIES)
Motorflange: for motorflange version only advise size - i.e.for IEC80 B14 put 80B14
No motor: leave all following parameters blank
Protection Degree: IP65, for selfbrake motor IP54 standard
Brake type: for brakemotors only: ES. FECA
Options: Advise if needed (ES. AB 2'shaft)

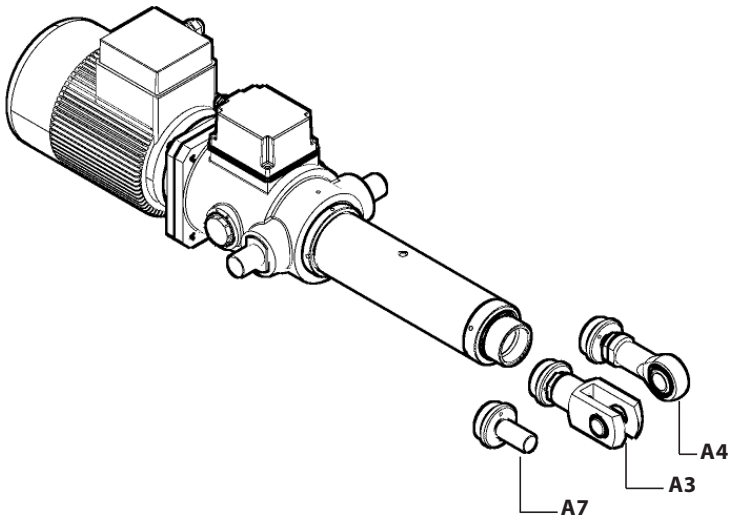
**ENCODER:** (Pag. ACCESSORIES)
None: Leave blank

**LIMIT SWITCHES:** (Pag. ACCESSORIES)
None: Leave blank

**POTENTIOMETER:** (Pag. ACCESSORIES)
**POT01A** (1Kohm) **POT10A** (10Kohm) None: Leave blank

**FRONT END:**
**A3** = Yoke + Clip **A4** = Rod end **A7** = Male threaded pin

**NOTE:** COMPLETE THE ORDERING KEY ADDING THE OPTIONS YOU CAN FIND IN THE "ACCESSORIES AND OPTIONS" SECTION



MecVel®

OPTIONS:

| | |
|---|---|
| A | = Stainless steel version (pag. 89) |
| AA | = Industry version (pag. 90) |
| B | = Bellows boot (pag. 87) |
| CG | = Bellflange with coupling (on request) |
| E | = Viton seals (pag. 89) |
| FX | = Anticorrosion painting (pag. 90) |
| FXC | = Cataphoresis (pag. 90) |
| G | = Safety nut (pag. 87) |
| H | = Handwheel (pag. 88) |
| L | = Anti rotation device (pag. 85) |
| MM | = Manual driving for ALI1 and ALI1-P models (pag.89) |
| N | = Manual driving with safety limit switch (pag.88) |
| O | = Body integrated Swivelling shafts (on request) |
| OA | = Front Swivelling plate (on request) |
| OP | = Rear Swivelling plate (on request) |
| P | = Handwheel and safety-switch (pag. 88) |
| PO | = Rear-pipe for swinging movement (on request) |
| S | = Torque limiter (pag.85) |
| T | = Additional shaft (pag.86) |
| Z | = Low noise (pag. 89) |

N. DIS. = Drawing number: Request of no standard options.

**ACCORDING TO THE OPTIONS DESIRED, ADD THE IDENTIFICATION LETTERS AT THE END OF THE ORDERING KEY RELATED TO THE PRODUCT CHOSEN**

Examples:

**ALI5 / 0300 / M01 / CA-400-50-T-71-2-0,55 / B5+AB / M1-FC1 / 1 / E05 / 2FC0 / P0T01A / P1 / A1**

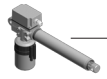
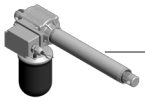
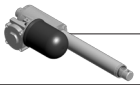
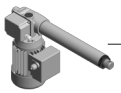
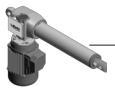
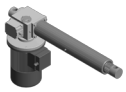
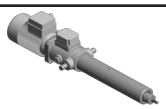
Ordering key for standard product

**ALI5 / 0300 / M01 / CA-400-50-T-71-2-0,55 / B5+AB / M1-FC1 / 1 / E05 / 2FC0 / P0T01A / P1 / A1 + AA + S + T**

Ordering key for standard product + options

**ALI5 / 0300 / M01 / CA-400-50-T-71-2-0,55 / B5+AB / M1-FC1 / 1 / E05 / 2FC0 / P0T01A / P1 / A1 / S + T / N.DIS**

Ordering key with NO standard options

| OPTION / ACCESSORY | POWER SUPPLY | | PROTECTION CLASS | | LIMIT SWITCHES | POTENTIOMETER | ENCODER | ANTIROTATION "L" | TORQUE LIMITER "S" | ADDITIONAL SHAFT "T" | SAFETY NUT "G" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| See page | 74 | | 76 | | 77 | 82 | 83 | 85 | 85 | 86 | 87 |
| MODEL | DC | AC | IP 54 | IP 65 | | | | | | | |
| **ALI1**  | ● | / | / | ● | ○ | / | ○ | ○ | / | / | / |
| **ALI1-F** | ● | / | / | ● | ● | / | ○ | ○ | / | / | / |
| **ALI1-P**  | ● | / | / | ● | ○ | / | ○ | ○ | / | / | / |
| **ALI1-PF** | ● | / | / | ● | ● | / | ○ | ○ | / | / | / |
| **ALI2**  | ● | ● | ● AC | ● ○ DC AC | ○ | / | ○ | ○ | ○ | / | ○ |
| **ALI2-F** | ● | ● | ● DC | ● ○ DC AC | ● | ○ | ○ | ○ | ○ | / | ○ |
| **ALI2-P**  | ● | / | / | ● | ○ | / | ○ | ○ | / | / | ○ |
| **ALI2-PF** | ● | / | / | ● | ● | ○ | ○ | ○ | / | / | ○ |
| **ALI3**  | ● | ● | ● AC | ● ○ DC AC | ○ | / | ○ | ○ | / | / | ○ |
| **ALI3-F** | ● | ● | ● AC | ● ○ DC AC | ● | ○ | ○ | ○ | / | / | ○ |
| **ALI3-P**  | ● | / | / | ● | ○ | / | ○ | ○ | / | / | ○ |
| **ALI3-PF** | ● | / | / | ● | ● | ○ | ○ | ○ | / | / | ○ |
| **ALI4**  | ● | ● | ● | ○ | ○ | / | ○ | ○ | ○ | ○ | ○ |
| **ALI4-F** | ● | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| **ALI5**  | / | ● | ● | ○ | ○ | / | ○ | ○ | ○ | ○ | ○ |
| **ALI5-F** | / | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| **ALI5-P**  | / | ● | ● | ○ | ○ | / | ○ | ○ | ○ | / | ○ |
| **AV3**  | / | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | / | ○ |
| **ECV9092**  | / | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | / | ○ |
| **L02**  | ● | / | / | ● | ○ | / | ○ | ○ | / | / | ○ |
| **L03**  | ● | / | / | ● | ○ | / | ○ | ○ | / | / | ○ |
| **EC**  | / | ● | ● | ○ | ● | ○ | ○ | ○ | / | ○ | ○ |

● SERIES  / NOT AVAILABLE  ○ ON REQUEST

# ACCESSORIES AND OPTIONS

| OPTION / ACCESSORY | BELLOWS BOOT "B" | MANUAL DRIVING "H" "N" "P" "MM" | VITON SEALS "E" | STAINLESS STEEL "A" | LOW NOISE "Z" | PROTECTIVE PAINTING "FX" "FXC" | INDUSTRY VERSION "AA" | ELECTRONIC DEVICES | SWIVELLING SHAFTS HOLDER | REAR BRACKET |
|---|---|---|---|---|---|---|---|---|---|---|
| see page | 87 | 88-89 | 89 | 89 | 89 | 90 | 90 | 91 | 96 | 98 |
| MODEL | | | | | | | | | | |
| **ALI1** | / | ○ *Without Handwheel* | / | ○ | / | ○ | / | ○ | / | / |
| **ALI1-F** | / | | / | ○ | / | ○ | / | ○ | / | / |
| **ALI1-P** | / | ○ *Without Handwheel* | / | ○ | / | ○ | / | ○ | / | / |
| **ALI1-PF** | / | | / | ○ | / | ○ | / | ○ | / | / |
| **ALI2** | ○ | ○ AC | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI2-F** | ○ | ○ AC | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI2-P** | ○ | / | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI2-PF** | ○ | / | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI3** | ○ | ○ AC | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI3-F** | ○ | ○ AC | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI3-P** | ○ | / | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI3-PF** | ○ | / | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI4** | ○ | ○ | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI4-F** | ○ | ○ | ○ | ○ | ○ | ○ | / | ○ | / | ○ |
| **ALI5** | ○ | ○ | ○ | ○ | / | ○ | ○ | ○ | / | ○ |
| **ALI5-F** | ○ | ○ | ○ | ○ | / | ○ | ○ | ○ | / | ○ |
| **ALI5-P** | ○ | ○ | ○ | ○ | / | ○ | / | ○ | / | ○ |
| **AV3** | ○ | ○ | ○ | ○ | / | ○ | ○ | ○ | / | / |
| **ECV9092** | ○ | ○ | ○ | ○ | / | ○ | ○ | ○ | / | / |
| **L02** | ○ | / | ○ | ○ | / | ○ | / | ○ | / | ○ |
| **L03** | ○ | / | ○ | ○ | / | ○ | / | ○ | / | ○ |
| **EC** | ○ | ○ | ○ | ○ | / | ○ | ○ | ○ | ○ | / |

● SERIES / NOT AVAILABLE ○ ON REQUEST

# Motor choice guideline

MOTOR TYPE

| | |
|---|---|
| Version: | DC = direct current<br>AC = alternate current<br>PD = Special motorflange (provide drawing) |
| Voltage: | DC = V12 / V24<br><br>AC = Standard voltege table<br>MT = Multivoltage |
| Type:<br>( only for AC) | T = 3-phase<br>M = 1-phase<br>AT = 3-phase with brake<br>AM =1-phase with brake |
| Size: | AC: IEC 50/56/63/71/80/90/100/112/132 |
| Pole: | AC: 2 / 4 / 6 |

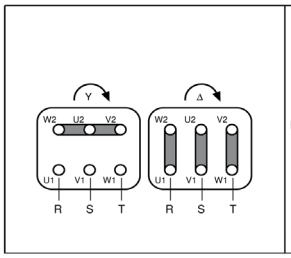
| Standard voltege table | | |
|---|---|---|
| [V] [Hz]<br>Rated Voltage: | | [V] [Hz]<br>Usable voltages |
| 230/400/50 | 277/480/60 | 240/415/50 - 220/380/50 - 265/460/60 - 255/440/60 |
| 190/330/50 | 220/380/60 | 200/346/60 - 208/360/60 - 230/400/60 |
| 208/360/50 | 254/440/60 | 200/346/50 - 240/415/60 |
| 400/690/50 | 480/830/60 | 380/660/50 - 415/717/50 |

AC MOTOR OPTIONS

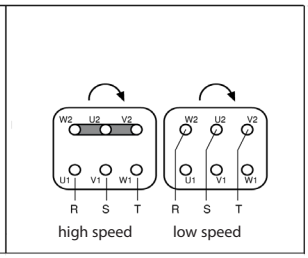
| | |
|---|---|
| Motorflange type: | IEC56B14 / IEC63B14 / IEC71B14 / IEC80 B14 / IEC90 B14 / IEC100/112 B14 |
| Service rate: | S3 30% |
| Insulation class: | F = standard (leave blank)<br>Advise only if different than "F" |
| Protection Degree: | IP54 ( leave blank)<br>IP65<br>TP = tropicalization<br>OTHER = advise<br>NONE = leave blank |

## Motor connections

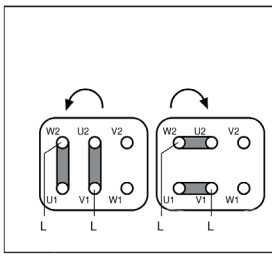
3-phase motor



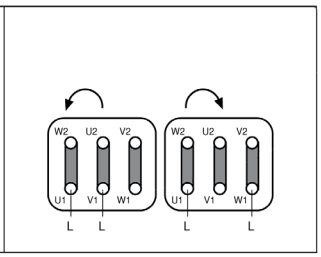

3-phase motor 2 speed




1-phase motor




1-phase motor balanced winding



# ACCESSORIES AND OPTIONS

Brake:

FECC DC brake negative action (standard)

Power Supply
230V±10% 50/60Hz AC side inside the brake. The brake is powered directly from the power supply of the motor (standard)
Motors with separated brake power supply and tensions in the range (24-205 Vdc) can be available on request.
In this case the brake needs a separated power supply from the motor and its code becomes FECC-AS-24 Vdc

FECA= AC brake

Power Supply
230/400V±10% 50/60Hz. The brake is powered directly from the power supply of the motor.
Motors with separated brake power supply and tensions in the range (24-690 Vac - 50/60 Hz) can be available on request.
In this case the brake needs a separated power supply from the motor and its code becomes FECA-AS-230 Vac 50 HZ

Separate brake power supply:
Achieved by means of an auxiliary terminal board, with fixed brake coil terminals, located inside the motor terminal box

Nb**:** On all motors equipped with inverters the brake must always have a separate power supply.

NO BRAKE = leave blank

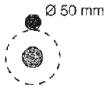
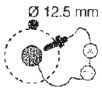
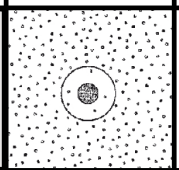
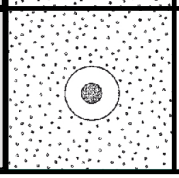
Options:

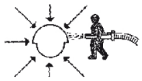
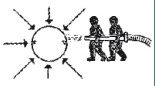
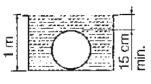
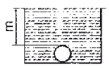
LS = hand release lever (leave blank)
NOTE: not available for motor IEC 50 IEC 56

AB = 2'shaft
OTHER = advise
NONE = leave blank

# HOUSING PROTECTION LEVEL (IPCode)

Example: **IP65**

| **First digit** Protection against solid objects | | |
|---|---|---|
| 0 | | Not protected |
| 1 |  | Protected against solid foreign objects of 50 mm diameter and greater |
| 2 |  | Protected against solid foreign objects of 12,5 mm diameter and greater |
| 3 |  | Protected against solid foreign objects of 2,5 mm diameter and greater |
| 4 |  | Protected against solid foreign objects of 1,0 mm diameter and greater |
| 5 |  | Protected against dust |
| 6 |  | Totally protected against dust |

| **Second digit** Protection against liquids | | |
|---|---|---|
| 0 | | Not protected |
| 1 |  | Protected against vertically falling water drips |
| 2 |  | Protected against vertical water drips with casing inclined up to 15° |
| 3 |  | Protected against spraying water |
| 4 |  | Protected against splashing water |
| 5 |  | Protected against jets of water |
| 6 |  | Protected against powerful jets of water jets |
| 7 |  | Protected against the effects of temporary immersion in water |
| 8 |  | Protected against the effects of continuos immersion in water |

The tables shown in this page are from IEC EN 60529 (CEI 70-1) standards

**MecVel standard products are equipped with IP54 or IP65**

## Electric / Electronic
## Stroke Control Devices

Actuators can host different stroke control systems: simple micro-switches (mechanical or magnetic) able to provide a signal to handle motor supply (ON-OFF operation), or electronic devices for servo-mechanisms.

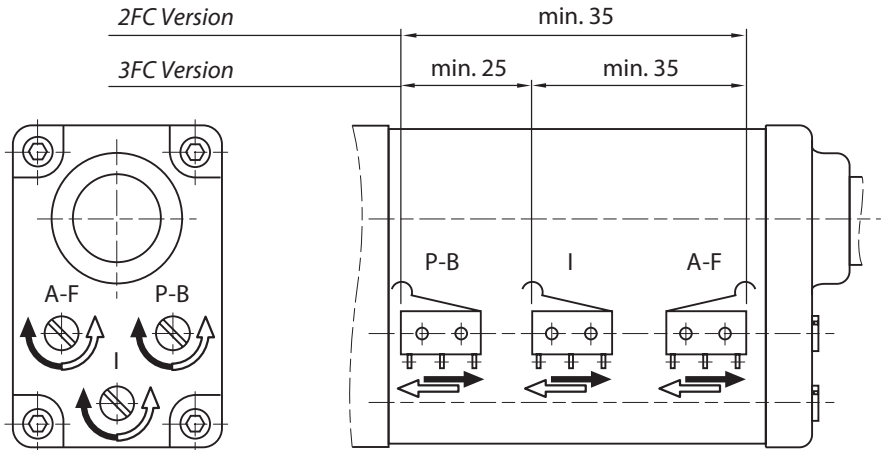
⚠ All wiring operations of actuator (motor and stroke control devices) must be done with power switched off. If not, both operator and actuator are at risk.

### LIMIT SWITCHES INTEGRATED IN TO COVERTUBE (ONLY FOR ALI1 AND ALI1-P MODEL)

This model is equipped with two limit switches (featuring one contact each). A version with a third limit switch, central positioning, is available.
Intermediate position changes according to push-rod moving direction.Tuning is adjusted by turning screws on actuator header. Each clock wise turn of the screw allows the micro switch to go 0.7 mm. forth, towards the header itself.
Look at the drawing to see how it works; letters have following meaning:

A-F = Front I = Intermediate P-B = Back

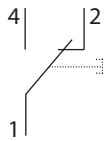
***Minimum stroke setting***




| *Vac Max. El. Ratings* | | |
|---|---|---|
| ***Voltage*** **Vac** | ***Resistive load*** **A** | ***Inductive load*** **A** |
| 125 | 5 | 2 |
| 250 | 5 | 2 |

| *Vdc Max. El. Ratings* | | |
|---|---|---|
| ***Voltage*** **Vdc (up to)** | ***Resistive load*** **A** | ***Inductive load*** **A** |
| 30 | 5 | 3 |
| 50 | 1 | 1 |

Limit Switches Features
- Housing: Glass fibre reinforce PA66
- Mechanism: Snap-action coil spring mechanism with stainless steel spring. Change over, normally-closed / normally-open




- Mechanical life: $5x10^6$ cycle minimum (impact free actuation)

## INTEGRATED MECHANICAL LIMIT SWITCHES

Changeover single-contact, cam-actuated micro-switches integrated onto actuator gearbox, getting movement by a small gearing connected to lead screw.
System is thus protected and compact but its limit lies in long strokes: since the stroke is directly related to cams angle of rotation, with long strokes this device is not able to perform.
Furthermore its stopping precision and repeatability are negatively affected by actuator non-self locking condition.
A potentiometer is also available for some of the gearbox ratios (hence speeds) and limited lengths of the stroke to be controlled.

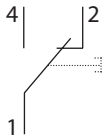
⚠ In case integrated mechanical limit switches are delivered already adjusted, manual rotation of push-rod will cause adjustment loss!

⚠ Running against mechanical stop causes serious damages to actuator's mechanical st*roke limit device!*

| Limit switches | | |
|---|---|---|
| ***Performance*** | **XCF Type** | **XGG Type ( on request)** |
| *Voltage* | 250 Vac | 230 Vac / 30 Vdc |
| *Resistive load* | 10 A | 16 A |
| *Motor load* | 2 A | 6 A |

### Limit Switches technical features

- Housing: Phoenolic-melamine thermosetting
- Mechanism: Snap-action coil spring mechanism with beryllium / bronze spring. Changeover contact, normally-closed / normally-open.




- Contacts: fine silver
- Terminals: gold flashed
- Mechanical life: $3x10^5$ (XGG) cycles minimum (impact free actuation).

## ORDERING KEY REFERENCES

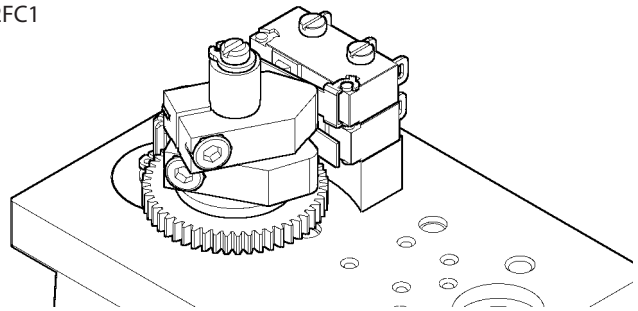
Mechanical limit switches:
2FC1 = 2 Microswitches XCF (standard version)
3FC1 = 3 Microswitches XCF (standard version)

2FC2 = 2 Micro XGG
3FC2 = 3 Micro XGG

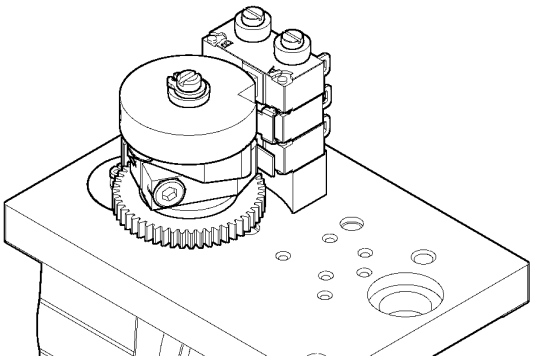
2FCD1 = 2 XCF Microswitches diode-wired
3FCD1 = 3 XCF Microswitches, 2 of them diode-wired
2FCD2 = 2 XGG Microswitches diode-wired
3FCD2 = 3 XGG Microswitches, 2 of them diode-wired
(for DC motor only and for loads up to 10A)

# ACCESSORIES AND OPTIONS

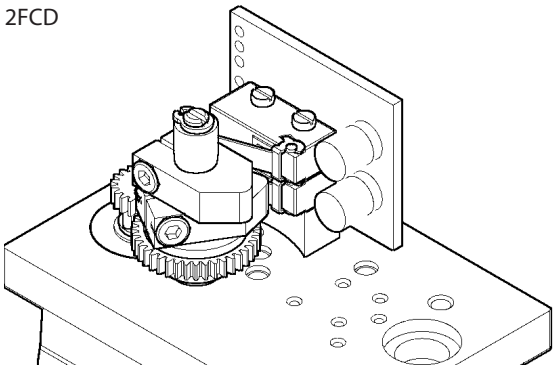
2FC1



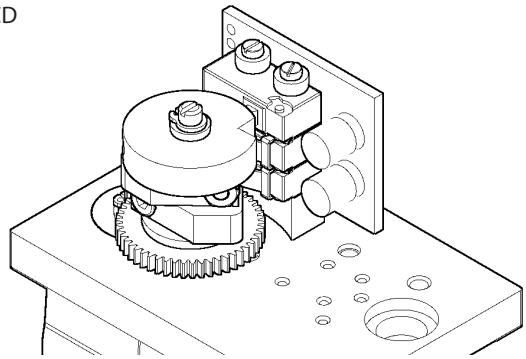
3FC1



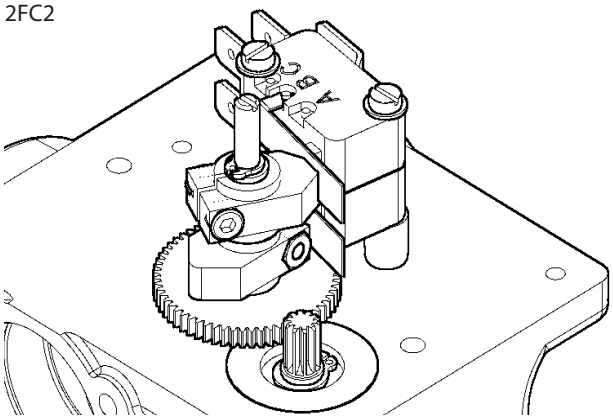
2FCD



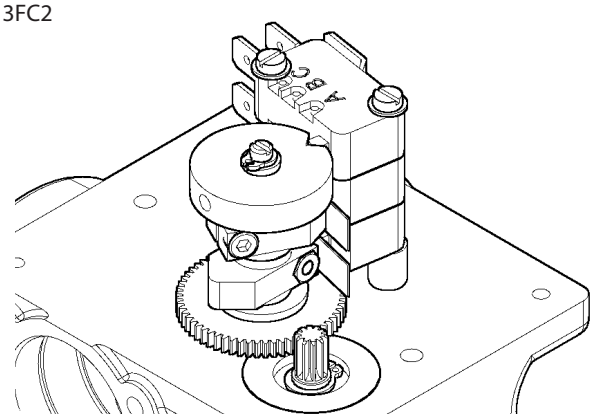
3FCD



2FC2



3FC2

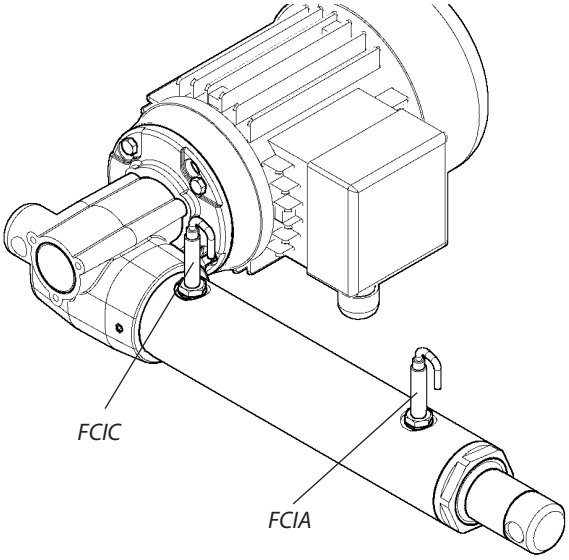


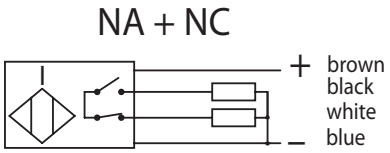
2FC1/ 3FC1 Available on ALI2 ALI2-P ALI3 ALI3-P

2FCD/ 3 FCD Available on ALI2 ALI2-P ALI3 ALI3-P ALI4, with 10A max consumption.

2FC2/ 3FC2 Available on ALI4 e ALI5; standard on AV3 ECV9092 EC

## Inductive sensors FCI



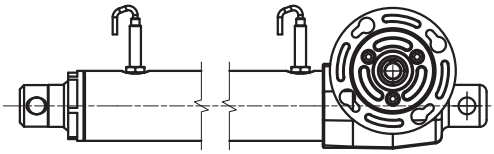

FCIC = All-closed inductive switch
FCIA = All-opened inductive switch

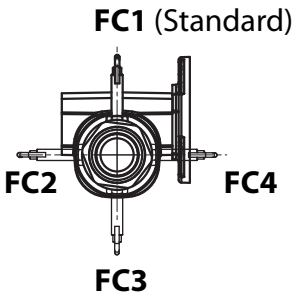
| FCI Inductive Limit switches | |
|---|---|
| DC voltage | 5 ÷ 40 Vdc |
| Temperature range | 25° ÷ 75° |
| Protection Level | IP67 |
| Switch status indicator | YELLOW LED |

### ORDERING KEY REFERENCES

**Inductive sensors:**
2FCI = 2 Sensors NO + NC

### FCI POSITION



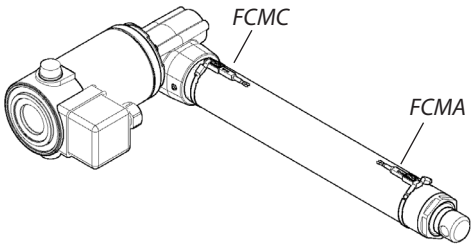


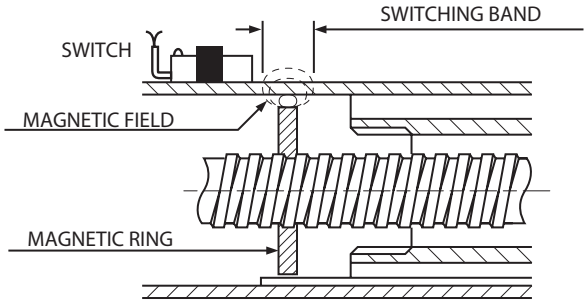
## Magnetic limit switches FCM

Magnetic sensors are activated by a magnetic field generated by a magnetic ring fixed to the nut.
These reads are mounted on outer tube with brackets; outer tube shall therefore be built with non-magnetic materials.

The magnetic switches are fixed as shown in the figure, the customer can rotate at will by adjusting the bracket.

⚠ Due to the size of the magnetic switches and to the so called switching band generated by the internal magnet the maximum working stroke is reduced by a few millimetres. This switching band width differs according to actuators size.




FCMC = All-closed magnetic switch

FCMA = All-opened magnetic switch

Supplied on ALI2 ALI2-P ALI3 ALI3-P ALI4 e ALI5

| *FCM magnetic Limit switches* | | | |
|---|---|---|---|
| ***Performance*** | ***Type*** **Reed NC** | ***Type*** **Reed NO** | ***PNP*** |
| *DC voltage* | 3 / 110 V | 3 / 30 V | 6 / 30 V |
| *AC voltage* | 3 / 110 V | 3 / 30 V | / |
| *25°C Current* | 0,5 A | 0,1 A | 0,20 A |
| *Power* | 20 VA | 6 VA | 4 W |
| *Supply cable* | PVC 2 x 0,14 mm | PVC 2 x 0,14 mm | PVC 3 x 0,14 mm |
| *Cablelenght* | | 2500 mm | |
| *Protection* | | IP67 | |

**Circuit Reed NC**
Circuit with normally closed Reed switch protected by a varistor against overvoltages caused when switching off, with LED indicator.

**Circuit PNP**

Circuit with Hall-effect switch and PNP outlet.

Protected against overvoltage spikes and reverse of polarity.
With LED indicator.

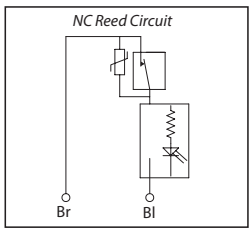
**Circuit Reed NO**
Circuit with normally open Reed switch protected by a varistor against overvoltages caused when switching off, with LED indicator.

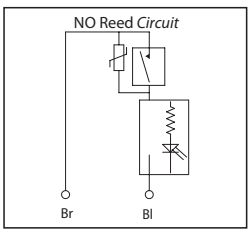
**ORDERING KEY REFERENCES**

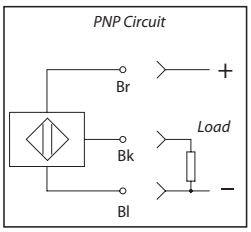
**Magnetic limit switches*:***

2FCM0 = 2 Sensors circuit Reed NC
(standard version without prior information)

2FCM1 = 2 Sensors circuit Reed NO
2FCM2 = 2 Sensors PNP



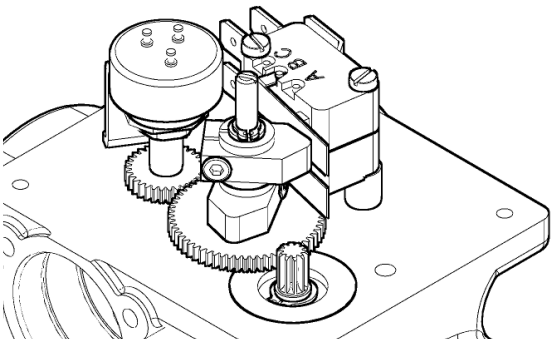



**INTEGRATED LIMIT SWITCHES AND POTENTIOMETER**
**Stroke Control devices Assembly**

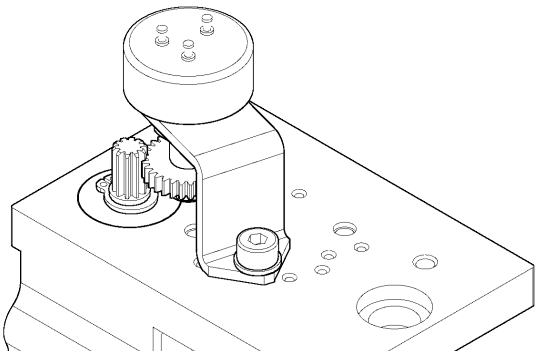
**Potentiometer**

Absolute feedback for actuator position monitoring: it can be installed alone or together with limit switches, so to achieve end positions control also. Potentiometer movement comes from the same gearing of the integrated limit switches therefore is has the same limit: long strokes cannot be controlled. Please refer to each actuator performance table to know max achievable length.
Furthermore potentiometer electric angle cannot always be achieved.

**Version with Limitswitches and Poteniometer**

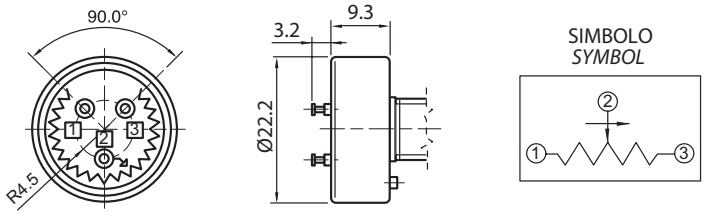


**Version with Poteniometer only**



Not Supplied on ALI1 e ALI1-P L02 L03.

| *Spinning potentiometer* | |
|---|---|
| ***Performances*** | ***Type* (A)** |
| Max. angle | 340° ± 3° |
| Resistance | 1K / 5K / 10K (standard) |
| Voltage | MAX 10 V |
| Indipendent linearity | ± 2% |
| Tolerance | ± 20% |
| Temperature coefficient of resistance | 600 ppm / °C |




***ORDERING KEY REFERENCES***

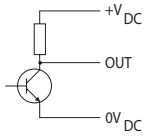
***Potentiometers:***
POT01A = 1 k Ohm
POT05A = 5 k Ohm
POT10A = 10 k Ohm
(to be adjusted by end-user)

## ENCODER

### Incremental Encoder

An incremental rotative transducer converts spinning movement into digital pulses. It can be installed on actuator, by using a longer worm-screw extension (rotating at the same speed of the motor) and coming out from the gearbox on opposite side of motor, or directly on AC or DC motors.
Its digital output allows for a relative (not absolute) feedback on actuator position, hence, every time machinery is resetted, encoder shall be given the zero position.

**Encoder mounted on DC motors(see table below)**

| Model | Encoder features | Wiring Diagram | Type Encoder |
|---|---|---|---|
| ALI1<br>ALI1-P | • Power supply 5 V....24Vdc<br>• PUSH-PULL<br>• 2 channel - 4 ppr square wave<br>• Max output current: 20 mA |  | See Wiring Diagram Ali1 |
| ALI2<br>ALI2-P<br>ALI3<br>ALI3-P | • Power supply 5 V....24Vdc<br>• NPN open collector<br>• 2 channel - 1 ppr square wave<br>• Max output current: 100 mA |  | E01 |
| L02 | • Power supply 3,8 V....24Vdc<br>• NPN + pull-up resistor 3,9 KΩ<br>• 1channel 4 ppr square wave<br>• Max output current: 100 mA |  | E10 |
| L03 | • Power supply 3,8 V....24Vdc<br>• NPN + pull-up resistor 1,9 KΩ<br>• 2 channel 4 ppr square wave<br>• Max output current: 100 mA |  | E50 |

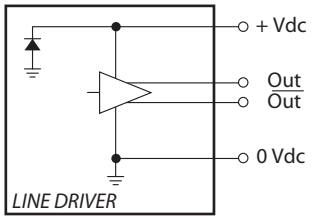
**Encoder mounted on AC motors**

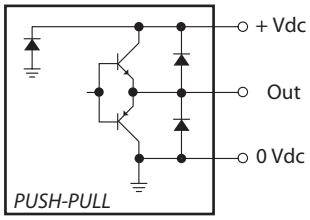
**Bidirectional incremental encoder,** with (standard) or without zero-pulse, protection IP54.

**Available ppr:** 50 / 100 / 200 / 400 / 500 / 512 / 1000 / ***1024 (standard)***

**Available output circuits: Line Drive 5 Vdc (standard)** Push Pull 24 Vdc / Open Collector NPN 10 -30 Vdc / OpenCollector PNP 10 -30 Vdc.

| | |
|---|---|
| Rosso / *Red* | ÷Vdc |
| Nero / *Black* | 0 Vdc |
| Ver de / *Green* | A |
| Giallo / *Yellow* | B |
| Blu / *Blue* | Z |
| Marrone / *Brown* | -A |
| Arancione / *Orange* | -B |
| Bianco / *White* | -Z |



## ORDERING KEY REFERENCES

**Encoder:**

only on DC motor)
E01 = NPN 2 channel 1 ppr

*(only on AC motor)*
*E05 = Push Pull 1024 ppr*
*E06 = Line Drive 1024 ppr (standard)*
*E07 = Open Collector NPN*
*E08 = Open Collector PNP*

*(only on actuator housing)*
*E00 = Push Pull 2 channels 4 ppr*
*E09 = Push Pull 1024 ppr*
*E10 = Line Drive 1024 ppr*
*E11 = Open Collector NPN*
*E12 = Open Collector PNP*

*E13 = Encoder not considered above*
*(according to customer request)*

**Only for L02:**
E10= NPN 1 channel 4 ppr
**Only for L03:**
E50= NPN 2 channels 4 ppr

| | E00 | E01 | E05 | E06 | E07 | E08 | E09 | E10 | E11 | E12 | E50 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALI2-DC | | ○ | | | | | | | | | |
| ALI2-AC | | | ○ | ○ | ○ | ○ | | | | | |
| ALI2-P | | ○ | | | | | | | | | |
| ALI3-DC | | ○ | | | | | | | | | |
| ALI3-AC | | | ○ | ○ | ○ | ○ | | | | | |
| ALI3-P | | ○ | | | | | | | | | |
| ALI4 | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| ALI5 | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| ALI5-P | | | ○ | ○ | ○ | ○ | | | | | |
| AV3 | | | ○ | ○ | ○ | ○ | | | | | |
| ECV9092 | | | ○ | ○ | ○ | ○ | | | | | |
| L02 | | | | | | | | ○ | | | |
| L03 | | | | | | | | | | | ○ |
| EC | | | ○ | ○ | ○ | ○ | | | | | |

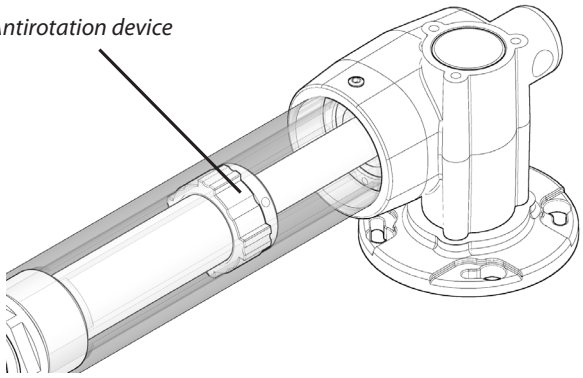
○ ON REQUEST

## Antirotation device

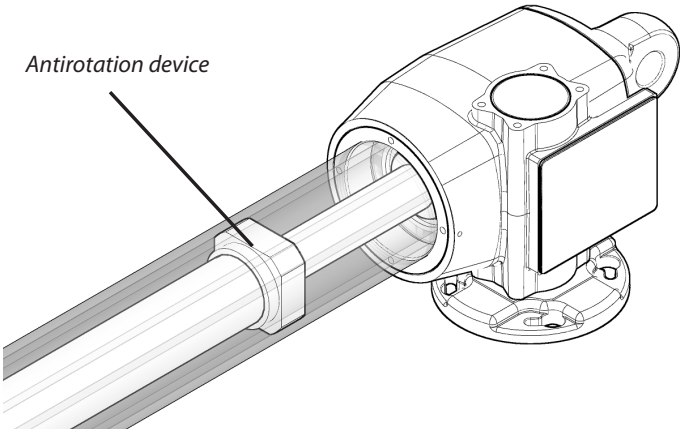
### Option "L"

The Anti-rotation device avoids push rod spinning around its own axis when travelling: it is essential in case of not guided load.
When the anti-rotation device is selected, the front-end is oriented to the rear-end in the assembly phase.
The anti-rotation device is made in different ways depending on actuators model.

*Antirotation device*



*Antirotation device*

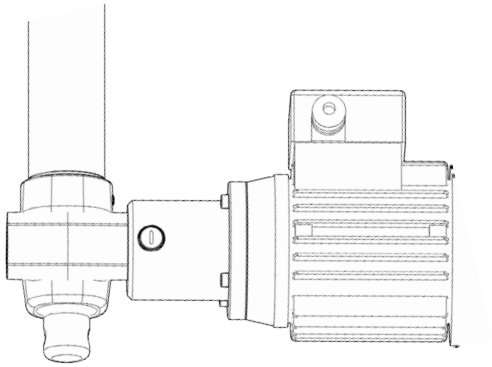


## Torque limiter

### Option "S"

It is assembled between motor and gearbox to prevent occasional overload.
Available for DC and AC motors with IEC flange.
As to dimensions contact Technical Department.

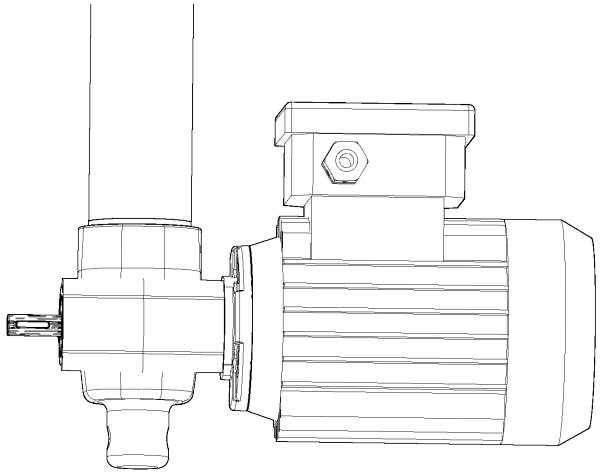
**Note:** Torque limiter reacts at 150-160% of nominal load.



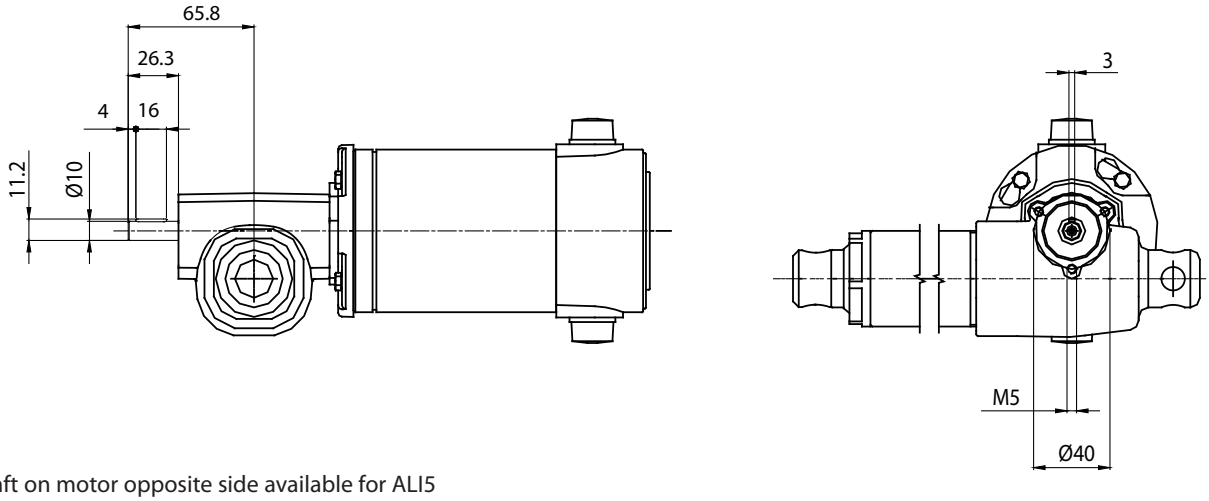
Torque limiter cannot be used as stroke control device with actuator getting to mechanical end-stops. In this way you will lose the torque limiter setting and get it unuseful

## Shaft on motor opposite side
### Option "T"

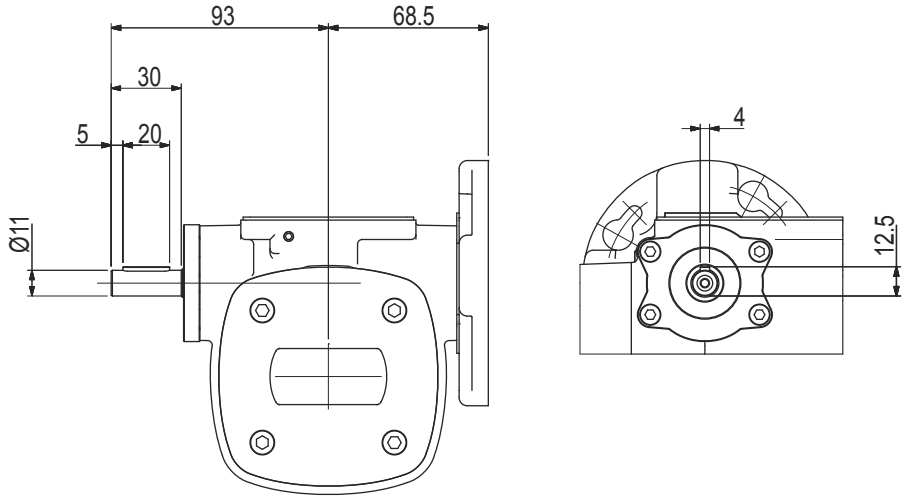
Available for models ALI4 and ALI5
As to dimensions contact Technical Department.



Shaft on motor opposite side available only on ALI4 and ALI4-F



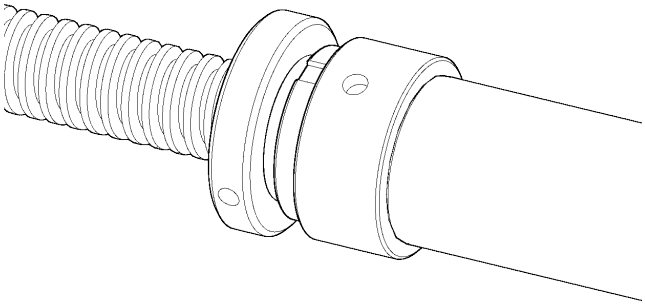

Shaft on motor opposite side available for ALI5

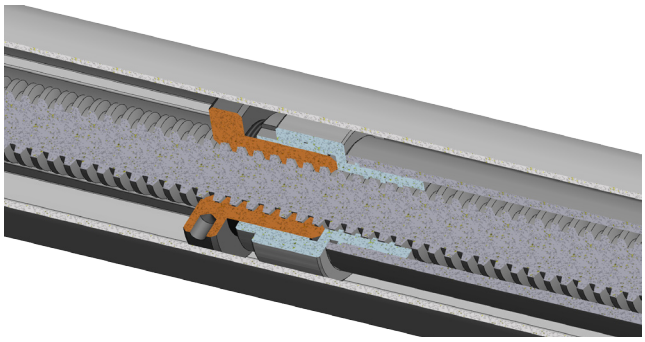


## Safety nut

### Option "G"

The safety nut has been designed to start working only in case of main nut maximum wear. This safety nut is connected to the main bronze nut and travels with it along the stroke.
When the bronze nut is completely worn out, the steel nut starts working on acme screw until it comes to a complete grip to acme screw.
This kind of nut can work in both directionsand that is integral with the load in both compression or traction (pushing / pulling)

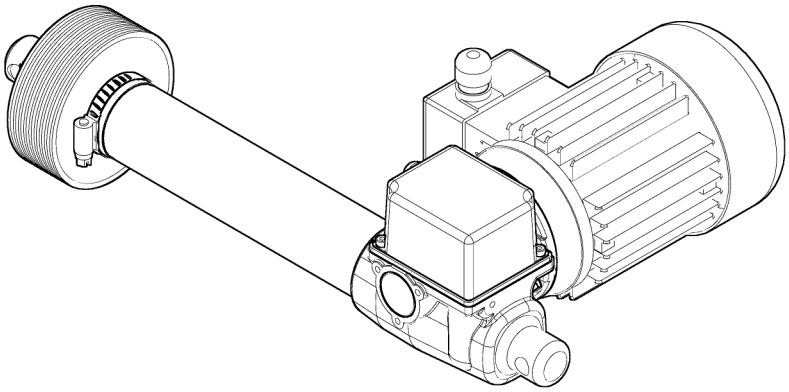




## Bellows boot

### Option "B"

Bellows boot protects push rods: pharmaceutical and food industries or aggressive environments are typical examples of applications where this option can be required.



## *Handwheel and safety-switch unit*

***Manual driving***

Option allowing actuator driving back in case power supply fails or some other inconvenience occurs. Second shafts on the back of the motors or extended worm-screws coming out from gearbox (see Encoder paragraph) can be manually turned with hand wheels, so to let actuator move without power supply for load disengagement. Gearing ratio and screw pitch determine number of revolutions to be done to run whole actuator's stroke: be aware that this number can be quite high.

**Option "P" e "N"**

**Only for model EC**

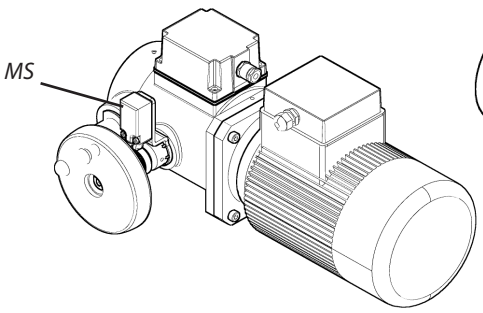
With safety limit switch MS

**Option "H"**

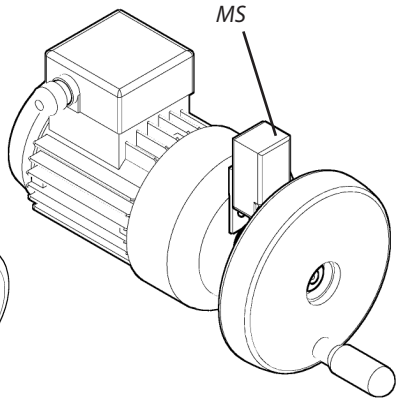
**For all model in A.C.**

Only for EC model with safety limit switch MS

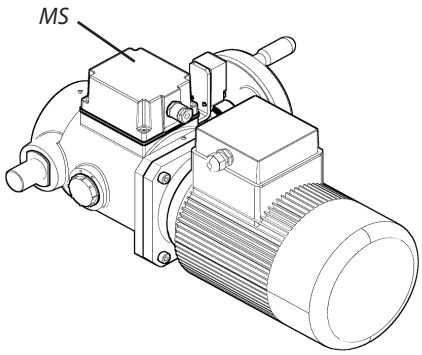
**OPTION P**




**OPTION H**

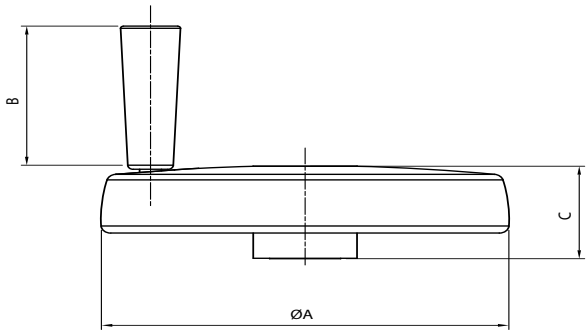



**OPTION N**




**Warning!**

**"Before connecting motor to power supply, you must connect power to safety microswitch positioned on hand wheel : so you can disconnect motor from power supply pressing safety switch and be able to work in safe conditions"**

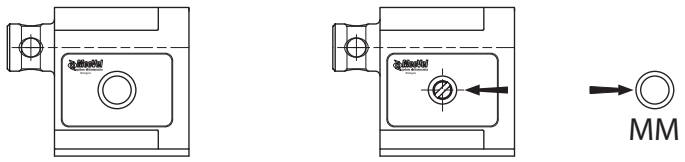



| *Dimensions* | | | |
|---|---|---|---|
| *Model* | *A* | *B* | *C* |
| *ALI2 ALI3 ALI4 ALI5 EC1 EC2 EC3 EC4* | *ϕ150* | *65* | *44* |
| *AV3 ECV9092 EC5* | *ϕ250* | *90* | *66* |

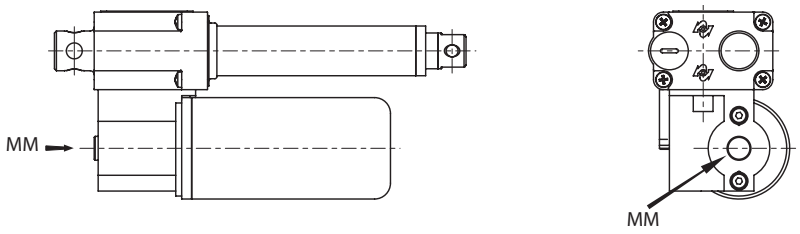
# ACCESSORIES AND OPTIONS

A manual driving system is available, for emergency situations.
By removing the cap support, movement can be controlled using a screwdriver.

**Option "MM" Mod. ALI1**




**Option "MM" Mod. ALI1-P**




## Viton seals

**Option "E"**

Viton seals are available as a replacement to those of NBR, except models ALI1 and ALI1-P.
For actuators with Option AA ( Steel industry version) Viton seals are included.

## Inox version

**Option "A"**

The stainless steel version includes front rear and push rod in stainless steel (X5CrNi18-10)

For AV3, ECV9092 and EC models the push rod is in double chromed .steel.

Tmax NBR = 110°C
Tmax Viton = 200°C

## Low noise Version

**Option "Z"**

It 'a version with special solutions for noise reduction.

## Protective Painting

**Option "FX"**

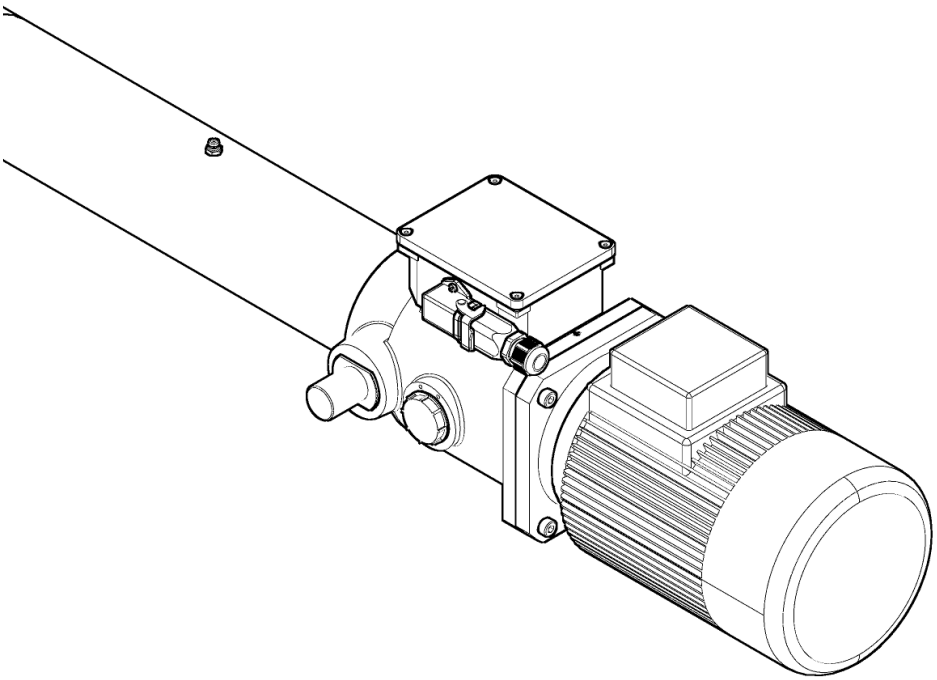
**ANTI-CORROSION** coating used on all metals and many other materials also against aggressive agents such extreme sea water, industrial fumes, acid rain, etc. .. It also has excellent resistance to impact and abrasion.

**Option "FXC"**

**CATAPHORESIS** is a electro deposition of paint in immersion with current continuous electricalworker. The deposited film confers to the pieces ones elevated characteristic anticorrosive, extending in the time the conservation also of all the parts that are not available with a traditional system to spray.

## Steel industry version

**Option "AA"**

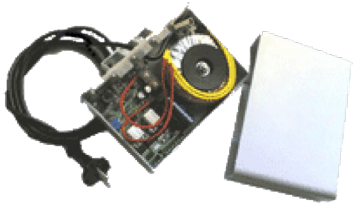
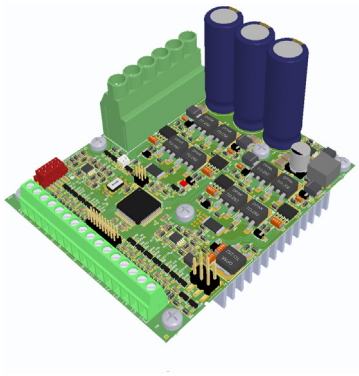


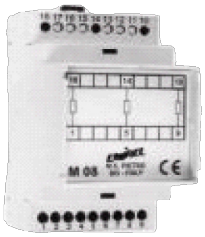
Steel works includes:
Larger limit switches box.
Brass gears and cams.
Metal connectors.
Viton seals.
Mechanical limiter with warning sensor.
Handwheel for manual driving (standard pos.N; optional P and H).
Front end with shock absorber.

For further information contact our technical dept.

## Electronic Devices

***Electronic control cards***

| Code | Data | Application | Picture |
|---|---|---|---|
| PF.0014 | Driver for 1 actuator whith 24 Vdc motor<br>Power supply: 230 V - max 4A (for 24 Vdc motors)<br>Amperage limitation<br>Sound or light signal of movement | All Ø61,5 and Ø40 motors may work with amperage limitation |  |
| PF.0015 | Infrared remote control - 2 bottons for PF0014 | Accessory for PF0014 |  |
| PF.0050 | Driver for 2 actuators with 12 Vdc motor<br>Power supply: 12 Vdc +/- 10% 4-28A (for 12 Vdc motors)<br>Stroke limits control normally closed<br>Amperage limitation<br>Radio remote control - 4 bottons | I MAX = 28A<br>Tutti i motori in<br>All 12V motors<br>Ø61,5 and Ø40 motors |  |
| PF.0100 | Driver for 1-2 actuators with 12-24 Vdc motor 15A<br>Power supply 10..48 Vdc<br>Stop by limit switches or programmable current threshold<br>Acceleration and deceleration ramp (PWM)<br>Parameters can be set by external interface, the interface is provided only in the first delivery<br><br>Optional:<br>CAN BUS<br>Synchronization 2 actuators<br>Radio Control | Dim. 86X72X50<br>I MAX = 15A<br>All 24V Ø61,5 and Ø40 motors<br>12-24V |  |

| Code | Data | Use | Picture |
|---|---|---|---|
| *CC021.0104*<br>*Wattmetric relay* | Connection = Motor<br>Full scale = 2,5 / 5,0 / 10,0 A<br>Power supply = 230 Vac<br>Motor power supply = 230 / 400VAC | The electric motor is the most common load to be controlled by an active power relay. The active power supplied to the motor gives the direct information of the instant load of the motor itself. Such information is more accurate than the one given by the current value. As a matter of fact the cosφ variations may change the power value without affecting the current value. |  |
| *CC021.0105*<br>*3 phase drop resistance* M08-8 | Option for wattmetric relay<br>Motor power = 440 Vac | The device has 3 resistances built-in when they are connected in series to 3 voltage pins they make a voltage drop. In this way it is possible to apply a voltage higher then the voltage accepted by the voltage pins |  |
| *CC021.0002*<br>*Transducer of position or signal*<br>*E 261B-A1-CD ( 0-10V / 4-20 mA 24 Vdc )* | Connection = Potentiometer 1-10 KHom<br>Device power supply = 24Vdc | The device supplies a potentiometer and measures the voltage on the wiper.<br>The voltage and current outputs are proportional to the position of the wiper of potentiometer |  |

# ACCESSORIES AND OPTIONS

| Code | Data | Use | Picture |
|---|---|---|---|
| *CC021.0022*<br>*Transducer of position or signal*<br>*E 261 B- A1-GMA*<br>*( 0-10 V / 4-20 mA / 115-230Vac )* | Connection = Potentiometer 1-10 KHom<br>Device power supply = *115-230Vac* | The device supplies a potentiometer and measures the voltage on the wiper.<br>The voltage and current outputs are proportional to the position of the wiper of potentiometer. |  |
| *CC021.0107*<br>*Low voltage current transformer* | Option for wattmetric relay<br>Full scale = 2,5 / 5,0 / 10,0 A | If the motor current (or of the application) is over 10A, it is necessary to use a TA.../5 together with Mod.A or TA...1 together with Mod.B and the range will be set at 5A or 1A. |  |
| *CC021.010*<br>*Current relay* | Connection = Motor<br>Full scale = 2,5 / 5,0 / 10,0 A<br>Driver power supply = 230 Vac<br>Motor power supply = single / 3 phase | This unit is designed to monitor the current of a load with a max or min set point (built-in CT).<br>It is used to monitor a single or threephase load (typically a motor) for performing a protection with one alarm.<br>Max set point (or min) divided in 10 parts to be set by means of a small screwdriver on the front. |  |

## Wiring and connector (on request)

| Code | Data | Use | Picture |
|---|---|---|---|
| Male Connector Molex from 2 to 12 pins IP 00 (Es. CC010.0010 12 pins) | max 0.75 $mm^2$ max 6 A on the section 0.75 $mm^2$ | Encoder, microswitch and motor wiring |  |
| Female Connector Molex from 2 to 12 pins IP 00 (Es. CC010.0011 4 pins) | max 0.75 $mm^2$ max 6 A on the section 0.75 $mm^2$ | Encoder, microswitch and motor wiring |  |
| Female Connector Deutsch from 2 to 12 pins IP 65 (Es. CC010.0043 4 pins) | from 0.5 $mm^2$ to 1 $mm^2$ max 7.5 A sulla sezione da 1 $mm^2$ | Encoder, microswitch and motor wiring |  |
| Female Connector Deutsch from 2 to 12 pin IP 65 (Es. CC010.0324 6 pins) | from 0.5 $mm^2$ to 1 $mm^2$ Max 7.5 A sulla sezione da 1 $mm^2$ | Encoder, microswitch and motor wiring |  |
| Connector Amphenol 90° 3 or 6 pins (with corrugated sheath) IP 65 (Es. CC010.0022 3 pins) | from 0.5 $mm^2$ to 1 $mm^2$ Max 16 A for 3 pin, Max 13A for 6 pin on the section 1.5 $mm^2$ | Motor wiring |  |
| Male connector Amphenol 3 or 6 pins IP65 (Es. CC010.0298 6 pins) | from 0.14 $mm^2$ to 1.5 $mm^2$ Max 16 A for 3 pin, Max 13A for 6 pin on the section 1.5 $mm^2$ | Motor wiring |  |

# ACCESSORIES AND OPTIONS

| Code | Data | Use | Picture |
|---|---|---|---|
| Housings bulkead mounting right angle from 3 pin + ground to 16 pin + ground IP 66 (Es. CC010.0304 4pins) | From 0.5mm$^2$ to 2.5 mm$^2$ Max 10 A on the section 2.5 mm$^2$ | Encoder, microswitch and motor wiring |  |
| CC010.0309 Metal Housing, orizzontal input for 10 pins+ ground IP 66 | From 0.5mm$^2$ to 2.5 mm$^2$ Max 10 A on the section 2.5 mm$^2$ | Encoder, microswitch and motor wiring. |  |
| CC010.0316 Female Connector Molex 4 pin round PG9 | 0,16 mmq Max 4A | Encoder wiring |  |

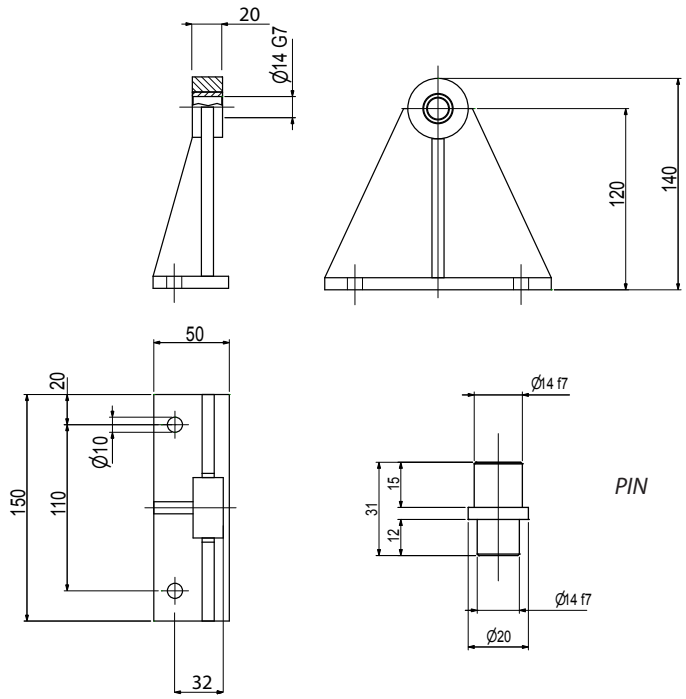
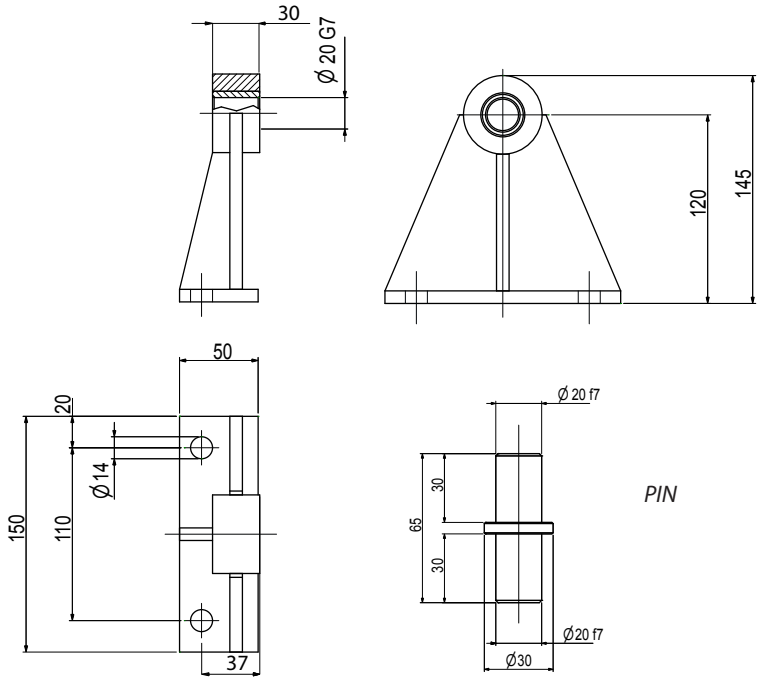
**Transformers**

| Code | Data | Dimension | Picture |
|---|---|---|---|
| PF.0033 | *Transformers ET 80PW (80 VA - 230 / 12V Vac)* | 136 x 60 |  |
| PF.0034 | *Transformers ET 150PW (150 VA - 230 / 12 Vac)* | 136 x 60 |  |
| PF.0036 | *Transformers ET 80PW (80 VA - 230 / 24Vac)* | 136 x 60 |  |
| PF.0037 | *Transformers ET 150PW (150 VA - 230 / 24 Vac)* | 136 x 60 |  |

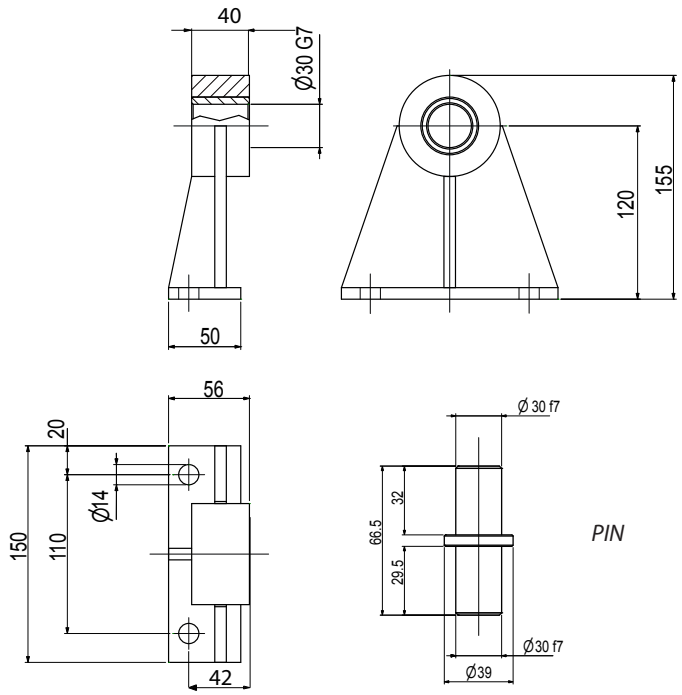
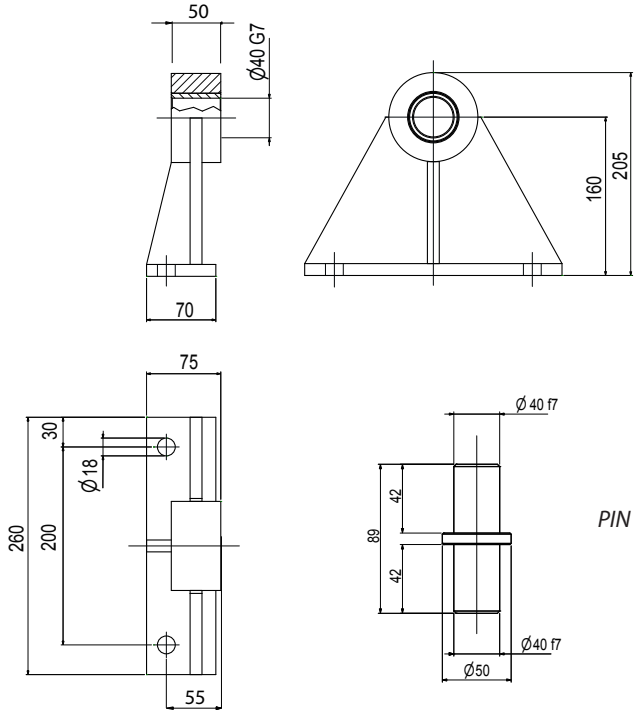
## Swivelling shafts holder.

**SP---**

To mount actuators series EC, four sizes of shaft holders

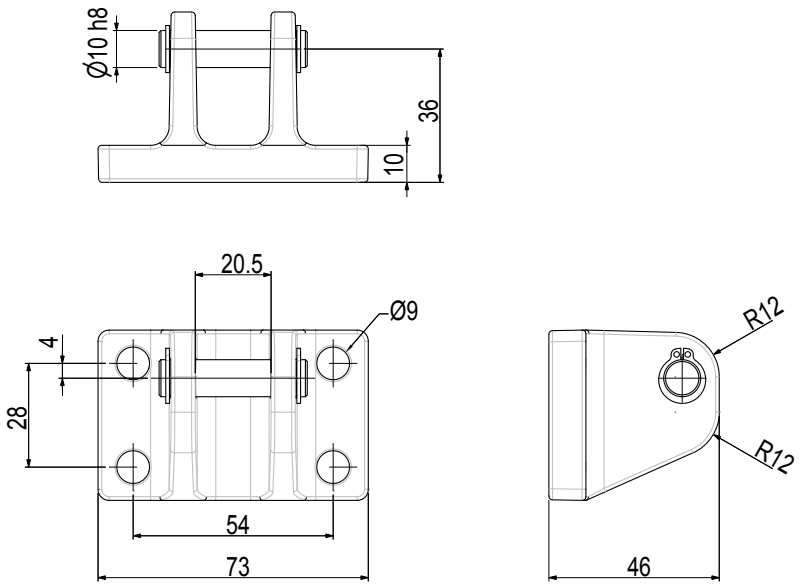
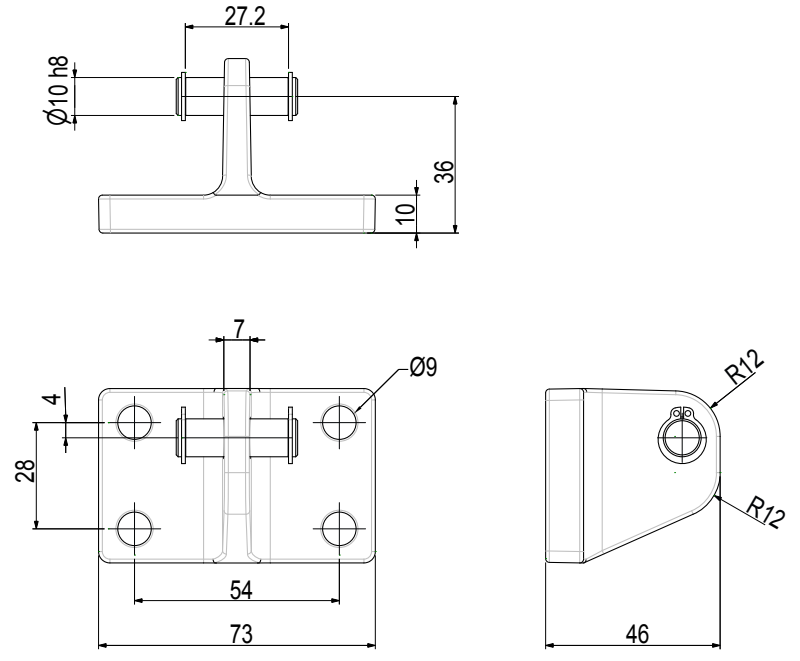
| Code | Description | Dimensions |
|---|---|---|
| SP0014 | Kit of 2 shaft holders for EC1 |  |
| SP0020 | Kit of 2 shaft holders for EC2 |  |

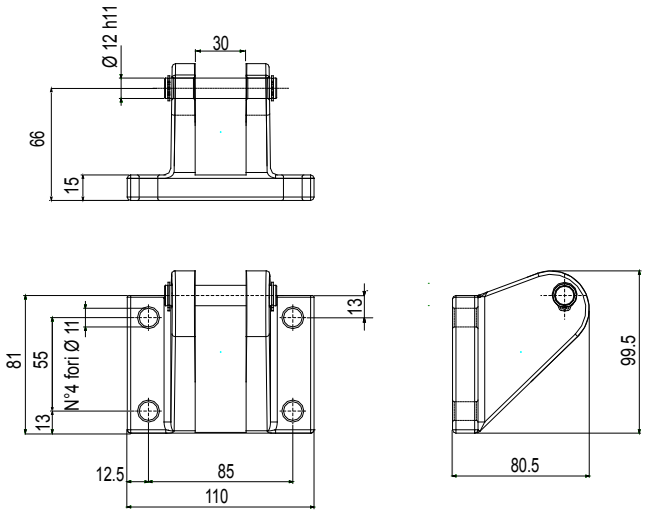
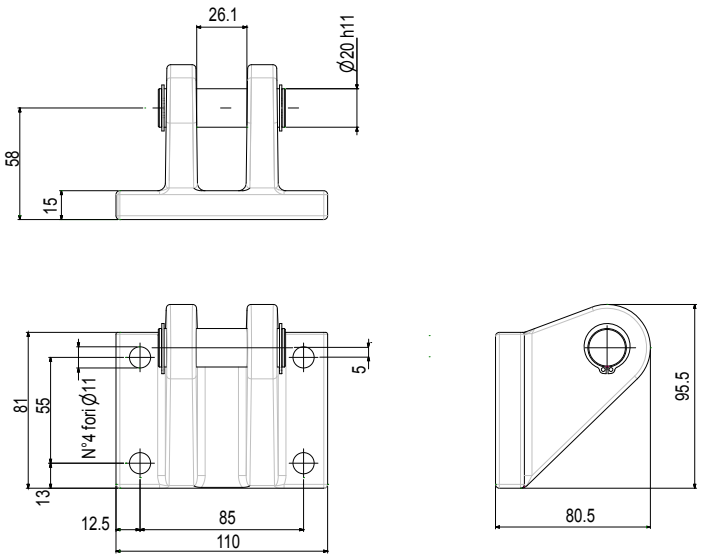
# ACCESSORIES AND OPTIONS

| Code | Description | Dimensions |
|---|---|---|
| SP0030 | Kit of 2 shaft holders for EC3 |  |
| SP0040 | Kit of 2 shaft holders for EC4 / EC5 |  |

## Bracket for front and rear ends

**SAA---**
To mount actuators having rear connection P1 / P2 and front head A1 and A4 the brackets are available for 3 series (ALI2 / ALI3 / ALI4 / ALI5)

| Code | Description | Dimensions |
|---|---|---|
| SAA0002 | *Asymmetric bracket for front and rear ends ALI2* |  |
| SAA0003 | *Asymmetric bracket for front and rear ends ALI3* |  |

| Code | Description | Dimensions |
|---|---|---|
| SAA0004 | Asymmetric bracket for front and rear ends ALI4 |  |
| SAA0005 | Asymmetric bracket for front and rear ends ALI5 |  |

GENERAL SALES CONDITIONS

Art. 1 Applicable law and conclusion of the contract
1.1 Any matter regarding the relationship between MECVEL and the Buyer that is not explicitly or implicitly resolved by the dispositions of the present General Sales Conditions or by possible special conditions agreed upon by the parties and settled in the sale contract (that in case of contrast will be considered prevailing) will be governed by the Italian law.
1.2 Any modification to the present General Sales Conditions must be made in writing.
1.3 The sale contract (hereinafter called "contract") has to be considered as concluded when, on reception of an order, the Producer has sent an acceptance in writing within the term eventually fixed by the Buyer.

Art. 2 Characteristics of the products and descriptive documents
2.1 Any information relating to working characteristics of the products, weights, dimensions, abilities, prices, outputs, and other data contained in catalogues, prospects, circulars, advertising, illustrations or price-lists of the Producer, have character of approximate indications. These information shall be binding only to the extent they are expressly referred to in the contract.
2.2 Any design or technical document enabling the manufacture of the supplied products or their parts, that the Producer has delivered to the Buyer before or after the stipulation of the contract, remains the Producer's property, and the Buyer cannot use, copy, reproduce, transmit or communicate it to third parties without the consent of the Producer.
2.3 The title of any intellectual or industrial right related to the products is and remains of the Producer.

Art. 3 Price
3.1 Unless otherwise agreed the price does not include value added tax, packing, custom costs, transport and accessory expenses, and it is subject to change according to the Producer.

Art. 4 Testing
4.1 Whether technical specifications for the tests are not specified in the contract, the tests will be carried out according to the procedures generally followed by the Producer.
4.2 If the Buyer claims for it at the moment of the order, the Producer has to communicate to him when the tests will take place, in order to allow his representatives to be present.
4.3 Unless otherwise agreed the Producer will be charged of all the expenses of the tests carried out in his establishments, in exception of those for the personnel of the Buyer.

Art. 5 Payment conditions and retention of title
5.1 Payments must be made with the means and to the expiration or expirations arranged by the parties. The obligation of payment is considered fulfilled when the due amount is received from the bank of the Producer in available funds.
5.2 If the delivery occurs before the complete payment, the Products delivered remain the Producer's property until complete payment is received by the Producer.

Art. 6 Interests on delayed payment
6.1 In case of delay in any payment by the Buyer, the Producer can actually suspend the fulfilment of his own obligations until complete payment is effected.
6.2 In addition to what is expressed in the preceding point, the Producer will have the right to interests on delayed payment on the amount that is not paid to the agreed date, beginning from the moment in which the payment is due up to the moment in which the payment is made, previous written notice to the Buyer. The parties arrange to fix the rate of the interests on delayed payment to the…..%.
6.3 Whether the delay of the Buyer in making any payment depends on a circumstance listed under article 10, the Producer is not entitled to any interest on delayed payment.
6.4 Whether the delay of the Buyer exceeds 60 days from the agreed date, the Producer has the right to withdraw from the contract, and consequently to get from the Buyer the restitution of the products and the compensation for damages, previous written notice to the Buyer and without having to require a favourable sentence of any Court.

Art. 7 Time of delivery
7.1 Except as otherwise agreed, the supply of goods will be Ex Works the Producer's establishment. The transfer of risks is determined in conformity to the Incoterms of the International Chamber of Commerce, in force at the moment of the contract conclusion.
7.2 Shall the delivery be delayed for any of the circumstances listed under article 10, or for any action or omission of the Buyer, a reasonable extension of the term of such delivery will be granted, considering all the circumstances of the delay.
7.3 Whether the Buyer does not withdraw the products to the agreed time, however he shall be engaged to make all the payments relating to the delivery as if the material had been delivered. The Producer shall care for the storage of the material at the Buyer's expenses and risks. On application of the Buyer the Producer has to assure the material at expenses of the Buyer.
7.4 Except if the Buyer does not withdraw the material because of one of the circumstances specified under article 10, the Producer can require the Buyer to withdraw the material within a reasonable term. Shall the Buyer, for any reason, not comply in the aforesaid term, the Producer shall have the right to withdraw from the contract, in regard to the part of the supply undelivered because of the above-mentioned breach of the Buyer, and consequently to get from the Buyer the compensation for those damages suffered because of his breach, previous written notice to the Buyer and without having to require the favourable sentence of any Court.
7.5 Possible penalties for delivery delays due to the Producer must be specified in writing at the conclusion of the sale contract, and they shall exclude any other remedy for his delayed delivery or non-delivery.

Art. 8 Warranty
8.1 Within the limits of the following dispositions, the Producer undertakes to remedy any imperfection that is consequence of any project, materials, or processing defect. Such obligation is limited to defects occurring during the period (hereinafter called "warranty period") of 12 months from the date of delivery to the buyer.
8.2 In order to claim the rights settled in the present article, the Buyer has to notify the Producer of all the manifested defects in writing, and he has to give him any possibility to ascertain and remedy them.
8.3 Upon reception of such notification during the warranty period, the Producer has to remedy the above mentioned defects at his own expenses. Except when the nature of the defects makes it convenient to carry out the reparation on the place, the Buyer shall forward the defective parts to the Producer, so that the latter can repair or replace them. The obligations of the Producer are considered duly carried out with the delivery to the Buyer of the repaired or replaced parts.
8.4 Except as otherwise agreed, the Buyer undertakes to bear all the costs and risks of transport of the defective parts, and the Producer those of the repaired or replaced ones, between the place where the material is located and the seat of the Producer and vice versa.
8.5 The defective products which the Producer has replaced according to the present article will be returned to the Producer within and not later than 15 days, from the date of reception of the goods sent for replacement, by the Buyer or by one of his customers on his behalf.

8.6 The liability of the Producer is limited to those defects manifesting under conditions of employment as provided in the contract and during a correct use. The guarantee does not cover defects due to causes arising after the transfer of the risks as described under clause 7.1, neither it concerns the normal deterioration.
8.7 Specially, the Buyer loses the right to the guarantee in the following cases: failure to comply with the instructions of use, installation and maintenance of the contractual products and the original spare parts, any modifications made to the products and their original spare parts without prior written consent of the Producer; any repairs made to the contractual products by persons not belonging to the Producer's network and using non-original spare parts.

Art. 9 Civil liability of the Producer
9.1 Shall the Buyer or his customers modify the products or use them for purposes other than those indicated in the catalogue without having obtained prior written consent to do so from the Producer, the Producer shall not be held liable for any loss or damage caused to people or property.
9.2 Pursuant to and for the purposes of Presidential Decree no. 224/88 the Producer shall be liable for any damages caused to third parties deriving from the use of the contractual products only in the event that the injured party is able to provide unassailable proof of the existence of the damage claimed, and of the causal link between any defects and the damage.
9.3 The Producer shall not be liable in the following cases: if the defect that has caused the damage did not exist at the moment the Producer delivered the contractual products to the Buyer; if the injured party, while aware of the defect and the danger to which it might give rise, deliberately exposed itself to it; if the damage is caused by a failure to comply with the instructions set out in the manual of use and maintenance of the contractual products, or when it is caused by the use of non-original spare parts mounted on the contractual products.
9.4 The Buyer shall promptly notify the Producer of any accident or potential safety issue relating to use of the contractual products.

Art. 10 Force majeure
10.1 Neither party shall be held in any way liable for any non-fulfilment of one of its obligations if, after the conclusion of the contract, there arise unexpectedly causes that prevent the fulfilment (such as strikes, fires, mobilisations, requisitions, embargo, monetary restrictions, riots, deficiency of means of transport, general lacks of raw materials and restrictions to the use of energy), to the extent in which it provides the proof (a) that such non-fulfilment was caused by unforeseeable events beyond its control, and (b) that at the moment of conclusion of the contract it could not reasonably foresee such event and its effects on its attitude to perform its contractual obligations, and (c) that it could not reasonably avoid or overcome such event or overcome its effects.
10.2 The party claiming for liability exemption shall notify the counterpart, as soon as possible and immediately after having discovered the impediment and its effects on its attitude to perform its obligations, of the existence of such impediment, as well as the effects of the same on its attitude to face its own obligations. Similar communication must be given as soon as the cause of liability exemption fails. Failure by the breaching party in giving such communication has the effect to make this party responsible for those damages that otherwise could have been avoided.
10.3 Whether the causes of liability exemption last for more than six months, each party shall have the right to terminate the contract. The parties will arrange the repartition of the expenses born up to that moment for the execution of the contract.

Art. 11 Jurisdiction
11.1 Any matter arising from the present General Sales Conditions and from the single sale contracts governed by them, shall be of exclusive competence of the Court of Bologna. However, as an exception to the above mentioned principle, the Producer is in any case entitled to bring his action before the competent court of the place where the Buyer has his registered seat.

**MecVel reserves the right to change products information and/or features without notice; all data contained in this catalogue are purely indicative and not binding for the company.**

# HT05
# HR05

| | |
|---|---|
| Max force | **5 kN** |
| Gear ratios | **1:4 1:10 1:16 1:30** |
| Acme screw | **18x4** |

Options:
integrated - magnetic
- inductive or mechanical
limit switches, rotary
potentiometer, encode

# HT10
# HR10

| | |
|---|---|
| Max force | **10 kN** |
| Gear ratios | **1:4 1:10 1:16 1:30** |
| Acme screw | **20x4** |

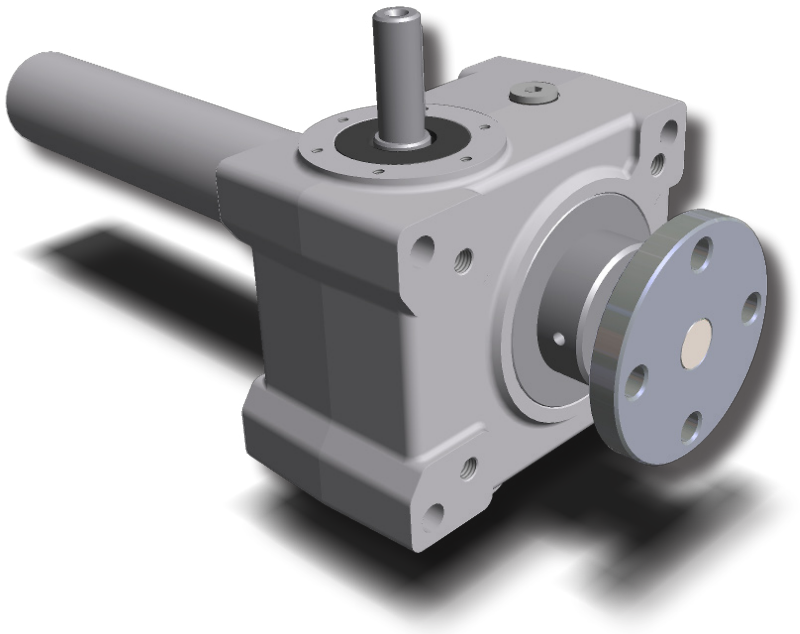
Options:
integrated - magnetic
- inductive or mechanical
limit switches, rotary
potentiometer, encoder

# HT25
# HR25

| | |
|---|---|
| Max force | **25 kN** |
| Gear ratios | **1:5 1:10 1:30** |
| Acme screw | **30x6** |

Options:
integrated - magnetic
- inductive or mechanical
limit switches, rotary
potentiometer, encode

# HT



# HT50
# HR50

| | |
|---|---|
| Max force | **50 kN** |
| Gear ratios | **1:5 1:10 1:30** |
| Acme screw | **40x7** |

Options:
integrated - magnetic
- inductive or mechanical
limit switches, rotary
potentiometer, encoder

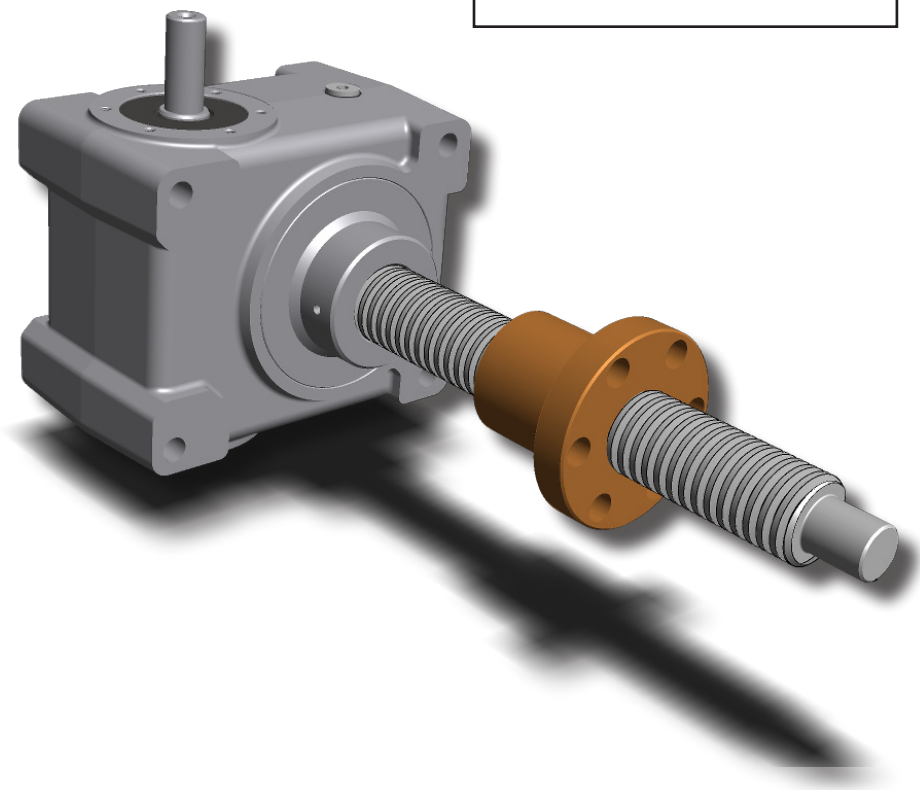
# HT100
# HR100

| | |
|---|---|
| Max force | **100 kN** |
| Gear ratios | **1:5 1:10 1:30** |
| Acme screw | **55x9** |

Options:
integrated - magnetic
- inductive or mechanical
limit switches, rotary
potentiometer, encoder

# HT200
# HR200

| | |
|---|---|
| Max force | |
| Gear ratios | |
| Acme screw | **200 kN** |
| | **1:5 1:10 1:30** |
| Options: integrated - magnetic - inductive or mechanical limit switches, rotary potentiometer, encoder | **70x10** |



**HR**

***NOTES***

SKSSWEDEN

MecVel®

**MecVel srl**
Via Due Portoni, 23 - 40132 Bologna (IT)
Tel: +39.051.4143737 - Fax: +39.051.404567
info@mecvel.com - **mecvel.com**